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ABSTRACT

This second document in a three-volume summative evaluation report presents a portion of the internal evaluation conducted by the Mountain-Plains program, a residential, family-based education program developed to improve the economic potential and lifestyle of selected student families in a six-state region. (The three-volume report presents both an overview of the evaluation design and results and a component by component analysis as well.) This document includes individual analyses of the following program components: office education, marketing, and tourism; building trades education, mobility, and transportation education; early childhood education; career guidance; and counseling services. In addition, a summary report on all the occupational programs and a discussion of the reliability/validity of the Mountain-Plains tests are included. (The other two documents comprising the summative evaluation report are available as CE 014 682 and CE 104 684.) (BM)

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ED150398

# SUMMATIVE EVALUATION

# OF

# MOUNTAIN-PLAINS

VOLUME II

11/76

U S DEPARTMENT OF HEALTH.
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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CE014683

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN-PLAINS COMPONENTS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER III - OFFICE EDUCATION, MARKETING AND TOURISM

JULY 1976

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.
BOX 3078 GLASGOW AFB, MONTANA 59231

# SUMMATIVE INTERNAL EVALUATION
# OF MOUNTAIN-PLAINS COMPONENTS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER III - OFFICE EDUCATION, MARKETING AND TOURISM

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July 1976

This Study is a Product of the
Research Services Division

David A. Coyle, Director
David L. Irving, Editor

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# INTRODUCTION TO INSTRUCTIONAL/CURRICULUM EVALUATION REPORT SERIES

Instructional/Curriculum Evaluation constitutes one aspect of the evaluative process of Mountain-Plains. Reports in this series, together with reports from External and Affective evaluation series, will provide a thorough documentation of the processes and products of Mountain-Plains. Major subdivisions of the series include:

1. User Trial Reports
2. Descriptive Characteristics
3. Summative Analysis
4. Reliability and Validity Studies
5. Student Evaluation of Staff and Curriculum

Individual reports in each series are currently available from, or are in the process of being incorporated into, the ERIC retrieval system. By the conclusion of the NIE research cycle, Instructional/Curriculum Evaluation Reports will number about 40 or 50. Many reports span two or more areas. These include overall internal evaluation reports and reports on the effects of affective variables on cognitive performance.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program research, and requires some indulgence on the part of the reader.

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# CHAPTER III
# OFFICE EDUCATION, MARKETING AND TOURISM

Office Education and the three curriculum areas in the core component Marketing & Tourism are grouped together in a single chapter due to the interdependencies among the four areas. This chapter will focus on these areas in terms of their objectives, completion characteristics (including support areas), and precenter characteristics of the individuals receiving occupational preparation in each curriculum area.

## OBJECTIVES

Preparation in all occupational areas is predicated upon the identification of specific tasks performed by the typical worker in a given job title. These tasks are articulated, in an increasingly specific fashion, into Mountain-Plains curriculum as job title objectives and LAP objectives. Office Education (CA 24), Lodging (CA 25), Food Service (CA 26), and Marketing & Distribution (CA 27), collectively contain 20 different job titles and 20 different job title objectives. These objectives are reiterated in greater detail in the 43 course objectives and the 108 unit objectives. These objectives, even at the unit level, are provided in Table 3.1.

The objectives in Table 3.1 represent, in general, a wide scale of task complexity, ranging from recognition of simple facts to involved analysis using internal and external criteria. In contrast to the objectives of Chapters I and II, the objectives in Table 3.1 are not entirely from the cognitive domain. Office Education contains several objectives which are clearly psychomotor or affective in nature. All typing speed and touch system practice drills, for example, are psychomotor. The human relations aspect of several courses or units represents objectives which can only be mastered on a non-cognitive or emotional level.

Job title objectives are contained in Appendix A. These objectives are not included in Table 3.1, because, in many cases, they span two or more curriculum areas, or scattered courses and units within one curriculum area.

Office Education contains six job titles: Clerk Stenographer, Clerk Typist, Bookkeeper, Keypunch Operator, Accounts Clerk and Clerk. Office Education provides, in addition, accounting support to students in various job titles in curriculum areas 25, 26 and 27. The work of a Clerk Stenographer is more complex than that of a Clerk Typist or Clerk; therefore, more of the objectives listed under Office Education in Table 3.1 are included in the job title. A detailed account of the course and unit requirements for each job title is contained in Appendix A.

Curriculum Area 25 contains the job titles: Assistant Manager Trainee, Desk Clerk, Night Auditor and Housekeeping Supervisor. The job title Assistant Manager Trainee also receives support from Office Education, Food Services and Marketing & Distribution. It is the most complex and demanding of all job titles in Lodging and requires mastery of virtually all CA 25 objectives for successful completion.

Food Service (CA 26) consists of the job titles: Restaurant Manager Trainee, Bakery Manager Trainee, Chef Trainee, Restaurant Cook, Institutional Cook and Second Baker. The managerial positions (Restaurant and

Bakery Manager Trainee) receive support from Office Education and Marketing & Distribution.

Curriculum area 27 is comprised of the job titles: Mid-Management Trainee, Professional Salesperson, General Salesperson and Checker/Cashier. Mid-Management Trainees receive accounting support from CA 24. Curriculum area 27 in turn provides support for Managerial positions in CA 25 and CA 26. More detailed descriptions of the requirements, including support, for these job titles are contained in Appendix A.

Table 3.1

CURRICULUM AREA 24: OFFICE EDUCATION

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.01.00.00 | Office Education (Course) | Given appropriate information and material, apply basic accounting principles. This will include analyzing, classifying, recording, and summarizing financial data. | 3.00 |
| 24.01.01.00. | Accounting Cycle-Simple Form (Unit) | Identify business vocabulary related to the accounting cycle in its simplest form. | 1.11 |
| | | Given appropriate information, prepare a balance sheet, record and post an opening entry, and analyze transactions affecting balance sheet accounts and income and expense accounts into their debit and credit parts. Journalize cash transactions for a service business. | 3.00 |
| 24.01.02.00. | Ledger, Worksheet, and Financial Statements (Unit) | Identify business vocabulary related to the accounting cycle in its simplest form. | 1.11 |
| | | Given appropriate information, post information from a journal to a ledger, prepare a six-column work sheet, prove the accuracy of posting, prepare an income statement and the balance sheet, and close the ledger. | 3.00 |
| 24.01.03.00. | Classifying Accounts, Adjusting Entries and Closing Entries (Unit) | Identify business vocabulary related to the accounting cycle for a merchandising business. | 1.11 |
| | | Given appropriate information, journalize transactions of a merchandising business, post to general and subsidiary ledger, reconcile a bank statement, prepare an eight-column work sheet with adjustments, prepare financial statements and do adjusting and closing entries for a merchandising business. | 3.00 |
| 24.01.04.00. | Payroll Transactions and Data Processing Systems (Unit) | Given appropriate material, keep accurate payroll records and prepare government reports relating to payroll records. Use some form of data processing system to record and report operations. Become familiar with the vocabulary and the symbols of automated data processing and become acquainted with unit record equipment and electronic computers. | 3.00<br>1.11 |

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.01.05.00 | Special Journals and the Cash Register System (Unit) | Using special journals, journalize and post transactions affecting purchases and cash payments, and sales and cash receipts. Record transactions in a cash register system. Replenish a petty cash fund. | 3.00 |
| 24.01.06.00 | Sales Tax, Bad Debts and Depreciation (Unit) | Apply principles and accounting procedures involved in accounting for special business transactions governed by laws including sales tax, bad debts expense, depreciation of fixed assets, and disposition of fixed assets. | 3.00 |
| 24.01.07.00 | Notes and Interest, Accruals, Partnership and Corporation (Unit) | Given appropriate materials, record notes, interest, and bank discount. Adjust, close, and reverse entries for accrued income and accrued expenses. | 3.00 |
| 24.02.00.00 | Business Writing (Course) | With 90 percent accuracy, complete the assigned writing project incorporating the principles of effective business correspondence.<br>With 90 percent accuracy, complete an objective test of 10 questions covering the principles of effective business correspondence. | 5.10<br>1.12 |
| 24.02.01.00 | Principles of Good Business Correspondence (Unit) | Complete assigned writing projects and an objective test incorporating the principles of effective business correspondence. | 5.10<br>1.12 |
| 24.02.02.00 | Application of Principles of Good Business Correspondence (Unit) | With 90 percent accuracy, complete the assigned writing project incorporating the principles of effective business correspondence. | 5.10 |
| 24.03.00.00 | Ten-Key Adding Machine (Course) | Operate the ten-key adding machine efficiently in a simulated office situation. | 3.00 |
| 24.03.01.00 | Addition/Subtraction (Unit) | Using the touch method, add and subtract efficiently operating all the number keys. | 3.00 |

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.03.02.00 | Multiplication (Unit) | Use the multiplication key and plus bar to multiply efficiently whole numbers, decimals, and fractions. | 3.00 |
| 24.04.00.00 | Printing Calculator (Course) | Operate the printing calculator accurately and efficiently in a simulated office situation. | 3.00 |
| 24.04.01.00 | Addition/Subtraction (Unit) | Using the touch method, add and subtract efficiently operating all the number keys. | 3.00 |
| 24.04.02.00 | Multiplication/Division (Unit) | In a simulated office situation, multiply and divide efficiently on the printing calculator. | 3.00 |
| 24.05.00.00 | Electronic Calculator (Course) | Operate the electronic calculator using the math skills of addition, subtraction, multiplication and division. | 3.00 |
| 24.05.01.00 | Introduction/Addition/Subtraction (Unit) | Identify and describe the function of the machine controls and solve addition and subtraction problems using the electronic calculator. | 1.21<br>3.00 |
| 24.05.02.00 | Multiplication (Unit) | Use correct controls to solve the following types of multiplication problems on the electronic calculator: whole numbers, fractions and decimals, multifactor, accumulative constant with addition of products, sum and difference of products, product of sum and differences. | 3.00 |
| 24.05.03.00 | Division (Unit) | Use correct controls and operations to solve the following types of division problems on the electronic calculator: whole numbers and decimals, whole numbers and fractions, constant division, sum and difference of quotients. | 3.00 |
| 24.05.04.00 | Practical Application Problems (Unit) | Use correct controls and operations to solve the following types of application problems on the electronic calculator: percentages, amount and percent of increase or decrease, discount and net amount, net amount using complements, markup and markdown based on selling or cost price, simple interest, true annual interest rate. | 3.00 |

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.06.00.00 | Data Processing (Course) | The student recognizes the data processing methods and applies the general data processing concepts and principles to specfic business operations. | 1.21<br>3.00 |
| 24.06.01.00 | Introduction to Business Data Processing (Unit) | The student identifies and recognizes terms, definitions of terms, and conditions related to the data processing cycle and operations in business applications. | 1.11 |
|  |  | The student names the particular step of the data processing cycle that applies to each part of a given activity sequence. Given a processing sequence, names the specific data processing operation that applies. |  |
| 24.06.02.00 | Manual and Mechanical Data Processing (Unit) | The student identifies and recognizes the terms, definitions of terms, operational characteristics, forms and devices used in manual and mechanical data processing methods. | 1.11 |
|  |  | The student correctly interprets data coded on edge-notched cards. | 1.21 |
| 24.06.03.00 | Punched Card Data Processing (Unit) | The student identifies, describes, or recognizes terms, definitions, characteristics, coding methods, data processing operations, functions, and procedures relating to punched-cards and punched-card machines. | 1.11 |
|  |  | The student correctly codes alphabetic and numeric data on an 80-column punch card; correctly codes numeric data on a mark-sensed card; given alphabetic and numeric data, designs the fields on an 80-column card to record the data; correctly identifies selected parts of the IBM 29 Card Punch; correctly identifies error notches and verification notches on an 80-column punched card. | 3.00<br>1.21 |
| 24.06.04.00 | Common Language Media (Unit) | The student identifies the applications of punched-tape and edge-punched cards and recognizes terms, definitions and characteristics of tape systems, card systems, optical scanning systems and their components. | 1.21 |

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.06.04.00 | Common Language Media (Unit) (Continued) | The students correctly converts decimal numbers to their binary equivalents; correctly codes alphabetic and numeric data on simulated punched tape; correctly codes numeric data on a simulated 96-column punch card; correctly codes numeric data on a simulated section of magnetic tape. | 3.00 |
| 24.06.05.00 | Electronic Data Processing (Unit) | The student recognizes terms, definitions, and procedures used in computer language and applications; identifies computer characteristics, equipment component names and functions; identifies terms, definitions, and processes associated with programming. | 1.11<br>1.12 |
| | | The student correctly completes a partial flowchart of a computer system including the following: the seven elements of the computer system, the three parts of the central processor, the direction of flow of data within the system, the direction of flow of instructions within the system, and the appropriate flowchart symbols. | 1.22 |
| 24.08.00.00 | Filing for Accounting and Clerical Clusters (Course) | File according to accepted filing rules and procedures. | 3.00 |
| 24.08.01.00 | Filing Rules (Unit) | File cards and letters accurately according to rules 1-20 for alphabetic filing. | 3.00 |
| 24.10.00.00 | Keypunch (Course) | Correctly keypunch a program card and card punch and verify 8 practice jobs. | 3.00 |
| 24.10.01.00 | Introduction to IBM 29 Print Card Punch (Unit) | Identify and operate functional control keys, special punch keys, functional control switches, and all other operative parts of the machine. | 1.12<br>3.00 |
| 24.10.02.00 | Numeric Keyboard Exercises/ Program Card (Unit) | Punch on the numeric keyboard using the "touch method," and from a set of instructions punch a program card. | 3.00* |

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*This objective also contains elements from the psychomotor domain.

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.13.00.00 | Full Keyboard Adding Machine (Course) | Operate the full keyboard adding machine accurately and efficiently in a simulated office situation. | 3.00 |
| 24.13.01.00 | Addition/Subtraction (Unit) | Accurately and efficiently add and subtract on the full keyboard adding machine. | 3.00 |
| 24.13.02.00 | Multiplication (Unit) | Accurately and efficiently multiply on the full keyboard adding machine. | 3.00 |
| 24.15.00.00 | Beginning Shorthand (Course) | Upon completion of this course, you will use Gregg shorthand to take dictation at a minimum of 55 wpm and transcribe notes accurately in acceptable business form. | 3.00<br>1.24 |
| 24.15.01.00 | Lessons 1-20 (Unit) | Read and write the Gregg shorthand theory presented in lessons 1-20. | 1.21<br>3.00 |
| 24.15.01.00 | Lessons 21-40 (Unit) | Read and write the Gregg shorthand theory presented in lessons 21-40. | 1.21<br>3.00 |
| 24.16.00.00 | Shorthand Transcription (Course) | Take dictation and transcribe shorthand notes into "mailable" form at commercial speeds. | 1.24<br>3.00 |
| 24.16.01.00 | Preparation (Unit) | Use efficient dictation and transcription techniques in a simulated office situation. | 3.00 |
| 24.16.02.00 | Speed Building (Unit) | Take dictation and transcribe shorthand notes into "mailable" form at commercial speeds. | 1.24<br>3.00 |
| 24.16.03.00 | Advanced Speed Building (Unit) | Take dictation and transcribe shorthand notes into "mailable" form at commercial speeds. | 1.24<br>3.00 |

## OFFICE EDUCATION (Continued)

| Page<br>FILE CODE | TITLE<br>(Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.17.00.00 | Keyboard Typing (Course) | Use parts of the typewriter needed for basic operation of the machine. Attain a score of 30 wpm with not more than three errors on a five-minute timed writing. | 3.00* |
| | | Find gross words per minute typing speed. | 1.25 |
| | | Identify spacing rules and spacing dimensions. | |
| | | Change the ribbon on at least one brand of typewriter. | 3.00 |
| 24.17.01.00 | The Alphabetic Keys (Unit) | Use the parts of the typewriter needed for basic operation of the machine. | 3.00 |
| | | Type the alphabetic keys by touch, keeping eyes on the copy. | 1.25 |
| | | Apply spacing rules. | |
| 24.17.02.00 | Speed Building (Unit) | Increase typing speed on timed writings. | ** |
| 24.17.03.00 | The Number Keys (Unit) | Type the number keys by touch, keeping eyes on the copy. | ** |
| 24.17.04.00 | The Symbol Keys and Related Spacing Rules (Unit) | Type the symbol keys by touch, keeping eyes on the copy and use related spacing rules. | ** |
| 24.17.05.00 | Production Typing for Bookkeepers (Unit) | Given appropriate materials, apply basic typing techniques in typing simple production typing problems. References may be used. No time limits are imposed. | 3.00 |
| 24.18.00.00 | Production Typing (Course) | Type 50 wpm with not more than three errors on a five-minute timed writing from a Civil Service booklet or general subject matter with words in common use and the more difficult words dispersed throughout the passage. | ** |
| | | Given appropriate material, type business letters, tables, common business forms and reports in mailable form. | 1.24<br>3.00 |

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*Objectives in this course also contain elements from the psychomotor domain.

**Psychomotor objectives.

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.18.01.00 | Typing Techniques (Unit) | Successfully use the following typing techniques:<br>a. Horizontal centering<br>b. Vertical centering<br>c. Reading proofreader's marks<br>d. Correcting errors<br>e. Spreading and squeezing letters<br>f. Tabulation<br>g. Word division<br>h. Chain-feeding envelopes | 1.25 |
| 24.18.02.00 | Business Letters (Unit) | Type business letters in mailable form at commercial rates. | 1.24<br>3.00 |
| 24.18.03.00 | Tables (Unit) | Type tables in mailable form. | 1.24<br>3.00 |
| 24.18.04.00 | Common Business Forms (Unit) | Type common business forms efficiently. | 3.00 |
| 24.18.05.00 | Reports (Unit) | Type common business reports efficiently. | 3.00 |
| 24.18.06.00 | Rough Draft Typing (Unit) | Given appropriate information, type from printed rough draft using proofreader's symbols and from handwritten copy in mailable form efficiently. | 3.00<br>1.21<br>1.24 |
| 24.19.00.00 | Machine Transcription (Course) | Correctly using a transcribing machine, transcribe selected prerecorded dictated material into mailable typewritten form within 40 minutes. | 3.00*<br>1.24 |
| | | Complete a 43 item objective test with 90% accuracy covering punctuation rules and spelling of common business terms. | 1.12 |
| 24.19.01.00 | Use of the Period and Question Mark (Unit) | Transcribe mailable letters efficiently from machine dictation. | 3.00 |

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*Also contains elements from psychomotor domain.

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.19.02.00 | Use of the Comma (Unit) | Transcribe mailable letters efficiently from machine transcription. | 3.00 |
| 24.19.03.00 | Use of the Semi-Colon (Unit) | Transcribe letters efficiently from machine dictation correctly using the semi-colon. | 3.00 |
| 24.19.04.00 | Use of the Colon (Unit) | Transcribe letters efficiently from machine dictation correctly using the colon. | 3.00 |
| 24.19.05.00 | Quotations (Unit) | Transcribe letters efficiently from machine dictation correctly writing quotations. | 3.00 |
| 24.21.00.00 | Modern Office Procedures (Course) | Identify definitions and terms related to standard office and secretarial procedures.<br>Apply basic secretarial skills to accomplish typical office jobs. | 1.11<br>3.00 |
| 24.21.01.00 | Mail Handling (Unit) | Apply, identify and describe mail handling techniques and postal and shipping services. | 3.00<br>1.12 |
| 24.21.02.00 | Communication (Unit) | Demonstrate effective, efficient, and economic use of the telephone and telephone company services. Meet all visitors to the office and handle these visitors appropriately. Arrange a business trip with elements of time, expense and travel method considerations. | 3.00<br>A2.2*<br>5.20 |
| 24.21.03.00 | Secretarial Recordkeeping (Unit) | Given recordkeeping problems and the necessary materials, accurately perform the required procedures. The problems will include three problems chosen by the instructor at the time the test is administered from the following five: Replenishing a Petty Cash Fund, Reconciling a Bank Statement, Making Cash Payments, Preparing an Income Tax Record, and Computing Net Pay. | 3.00 |

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*Affective domain.

## OFFICE EDUCATION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 24.21.04.00 | Processing Data (Unit) | Identify definitions, terms and conditions that are related to business data processing. Recognize methods and equipment for processing data, operations, and the steps in the data processing cycle. | 1.11<br>1.21 |
| 24.21.05.00 | Duplicating Methods (Unit) | Given appropriate materials and equipment, prepare duplicate copies using the spirit, stencil, electrostatic, and infrared processes. Identify characteristics of duplicating processes. | 3.00<br>1.21<br>1.12 |

## CURRICULUM AREA 25: LODGING SERVICES

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 25.01.00.00 | Housekeeping Operations (Course) | Perform housekeeping operations and procedures skillfully and efficiently. | 3.00 |
| 25.01.01.00 | Care of the Rooms (Unit) | Clean each type of room in a Hotel or Motel according to the procedures outlined in the LAPs. | 3.00<br>1.24 |
| 25.01.02.00 | Working With Staff (Unit) | List and describe the positions and duties of a Housekeeping Staff, prepare a job description, and interview and place staff. | 1.12<br>5.10 |
| 25.01.03.00 | Work Improvement Techniques (Unit) | Identify the basic steps of work simplification and work study, and the steps for time studies. | 1.21 |
| 25.01.04.00 | Organizing, Planning, Scheduling (Unit) | Recognize the importance of organizing and planning of the Housekeeping Department and the need for a staff schedule. | 1.12 |
| 25.01.05.00 | Housekeeping Material and Equipment (Unit) | Identify the costs, productivity and quality of materials and equipment, such as cleaners, floor cleaners and linens used in the Housekeeping Department. | 1.12 |
| 25.01.06.00 | Floor and Carpet Care (Unit) | Identify and describe the types of flooring, also the make up and care of each type. | 1.12 |
| 25.01.07.00 | Health and Safety (Unit) | Identify types of infection hazards and accidents. Describe ways of preventing these in a Hotel or Motel. | 1.12<br>1.21 |
| 25.02.00.00 | Front Desk Procedures (Course) | Demonstrate accepted methods for performing the duties of a front desk clerk in a motel or hotel of any size. | 3.00 |
| 25.02.01.00 | Introduction to the Front Office (Unit) | List staff organization and duties, complete checklist on terminology, and be able to identify concepts relating to the future of the hotel industry. | 1.12<br>1.11<br>1.31 |
| 25.02.02.00 | Front Desk Responsibilities (Unit) | State the steps in selling a room; list and describe the correct forms and procedures for reserving, registering and rooming a guest, | 1.22<br>1.31 |

## LODGING SERVICES (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 25.02.02.00 | Front Desk Responsibilities (Unit) (Continued) | and list the rules and regulations that apply to special events. Give a simulation of the process of selling a room, reserving, registering and rooming a guest. | 3.00 |
| 25.02.03.00 | Handling of Guest Charges and Credits (Unit) | Perform the following: | |
| | | a. Describe the correct procedures for checkout when the guest uses either cash or credit cards. | 1.22 |
| | | b. Properly use credit card equipment. | 3.00 |
| | | c. Demonstrate correct procedures for checking out the till. | 3.00 |
| | | d. Demonstrate correct posting of charges and credits. | 3.00 |
| 25.02.04.00 | Equipment used by the Desk Clerk (Unit) | Using the machines, forms and correct procedures, demonstrate the performance of Front Desk Shifts. | 3.00 |
| 25.03.00.00 | Night Auditing Procedures (Course) | Complete a night audit using the NCR 42 and Sweda 76, using the necessary forms and procedures. Recognize proper auditing procedures on the NCR Class 5, NCR 52 and the Sweda Data Register. | 3.00<br>1.21 |
| 25.03.01.00 | The Hand Transcript (Unit) | Prepare a transcript of given daily transactions. Prepare a recapitulation of transcript of given daily transactions. | 3.00 |
| 25.03.02.00 | Balancing Cashier Totals (Unit) | Using the correct given procedures and methods, adjust errors and prepare a "D" report worksheet. | 1.25<br>3.00 |
| 25.03.03.00 | Preparing the Night Audit (Unit) | Prepare a night audit using the correct forms and procedures as outlined in the LAP's. | 3.00 |
| 25.03.04.00 | Auditing on Miscellaneous Machines (Unit) | Describe and/or demonstrate the correct procedures, forms and policies associated with auditing on the given accounting machines: NCR 52, NCR Class 5, Sweda Data-Register. | 1.25<br>3.00 |

## CURRICULUM AREA 26: FOOD SERVICES

| Page<br>FILE CODE | TITLE<br>(Level) | OBJECTIVE |
|---|---|---|
| 26.01.00.00 | Kitchen Helper (Course) | Maintain a food service facility and its contents in a sanitary manner.<br>Properly clean and operate kitchen equipment in a corr<br>Identify employment conditions that encourage top perf<br>Identify those personal practices that demonstrate emp and concern. |
| 26.01.01.00 | Sanitation, Safety, Maintenance, and Equipment Care and Use (Unit) | Recognize adequate procedures for the use and maintena kitchen and its contents in a safe and sanitary manner<br>Maintain a kitchen and its contents in a safe and sani by:<br>1. Keeping the facility, all equipment, dishes, and clean and sanitary.<br>2. Handling and using equipment and supplies in a m avoids abuse and undue wear or damage.<br>3. Using procedures that protect the people in the from possible injuries.<br>4. Using procedures that prevent contamination of f |
| 26.01.02.00 | Employee Attitudes and Motivaation (Unit) | Recognize employment conditions and characteristics of affect employee attitudes and motivation.<br>Identify those practices of dress, personal hygiene an teraction that are desired for the food service employ |
| 26.02.00.00 | Short Order Cook (Unit) | Prepare, portion and garnish foods for meals that requ preparation time, meet desired quantity of serving req are visually appealing. The food preparation techniqu clude: deep fat frying, griddle cooking, sandwich mak making. |

## FOOD SERVICES (Continued)

| Page<br>FILE CODE | TITLE<br>(Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 26.02.01.00 | Food Preparation and Serving (Unit) | Prepare, portion and garnish foods for meals that:<br>1. Require a short preparation time.<br>2. Meet desired quantity of serving requirements.<br>3. Meet desired flavor requirements.<br>4. Are visually appealing.<br>5. Include preparation techniques for: deep fat frying, griddle cookery, egg cookery, sandwich making and salad making.<br>6. Schedules preparation of the ordered meal items to be completed at the same time. | 3.00 |
| | | Identify acceptable procedures for preparing, portioning and garnishing foods. | 1.21 |
| | | Identify characteristics of ingredients and equipment that affect food preparing, portioning, garnishing, displaying and storing. | 1.12 |
| 26.03.00.00 | Restaurant/Institutional Cook (Course) | Process foods for meals commonly served in restaurants and institutions that meet desired quality standards. | 3.00<br>1.24 |
| 26.03.01.00 | Food Preparation (Unit) | Prepare food for meals commonly served in restaurants and institutions that:<br>1. Meet desired quality standards for flavor and visual appeal.<br>2. Include preparation techniques for boiling, steaming, simmering, broiling, panfrying, sauteing, baking, roasting and large quantity processing. | 3.00<br>1.24 |
| | | Identify acceptable procedures for preparation of food commonly served in restaurants and institutions. | 1.21 |
| | | Identify the effect of the ingredients, equipment and processes on the food prepared. | 1.12 |
| 26.04.00.00 | Restaurant Manager Trainee (Course) | Plan, prepare and provide food and beverage service for guests in restaurant table and banquet settings. | 3.00 |
| | | Identify and describe the restaurant food service management functions involving facilities, supplies, equipment, staff and guest services. | 1.21 |

FOOD SERVICES (Continued)

| Page FILE CODE | TITLE<br>(Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 26.04.01.00 | Dining Room Service (Unit) | Select menu, plan food preparation and service, and provide food and beverage service for guests in restaurant table, banquet and buffet settings. | 3.00<br>5.20 |
| | | Identify the restaurant food service management functions involving facilities, supplies, equipment, staff and guest services. | 1.21 |
| 26.05.00.00 | Chef Trainee (Course) | Prepare gourmet food dishes according to recipes. Plan, prepare, and provide food and beverage service to guests in restaurant table and banquet settings. | 3.00<br>5.20 |
| 26.05.01.00 | Gourmet Cooking and Service (Unit) | Prepare gourmet food dishes according to recipes. Plan, prepare, and provide food and beverage service to guests in restaurant table and banquet settings. | 3.00<br>5.20 |
| 26.06.00.00 | Second Baker (Course) | Identify ingredients used in baking. Relate the ingredient characteristics and purpose to the baking process. Prepare bakery products following recipes and using appropriate procedures and equipment. | 1.12<br>1.21<br>3.00 |
| 26.06.01.00 | Baking (Unit) | Identify ingredients used in baking. Relate the ingredient characteristics and purpose to the baking process. Prepare bakery products following recipes and using appropriate procedures and equipment. | 1.12<br>1.21<br>3.00 |

## CURRICULUM AREA 27: MARKETING & DISTRIBUTION

| Page<br>FILE CODE | TITLE<br>(Level) | OBJECTIVE | BLOOM<br>CODE |
|---|---|---|---|
| 27.01.00.00 | Marketing Operations (Course) | Identify the components of and the interrelationship within the distribution system, and the services provided by wholesale and retail businesses. | 1.12<br>1.21<br>1.32 |
| 27.01.01.00 | The Marketing Process (Unit) | Identify the processes and principles governing the ways in which goods and services are directed from the producer to the consumer. | 1.21 |
| 27.01.02.00 | Wholesaling (Unit) | Identify the main functions of wholesale businesses, the functions of the six main wholesaling specialists, and the seven major services provided by wholesalers to their customers. | 1.21<br>1.12 |
| 27.01.03.00 | Retailing (Unit) | Identify the four main ways of selling goods and services at retail, and identify the characteristics of the fourteen (14) main types of retail sales outlets. | 1.21 |
| 27.02.00.00 | Merchandise Distribution Procedures (Course) | Identify procedures used to process merchandise and correctly enter information on shipping, receiving, and purchase documents. | 1.21 |
| 27.02.01.00 | Shipping (Unit) | Identify the procedures used to prepare merchandise for shipping. Correctly enter necessary information on shipping documents. | 1.21 |
| 27.02.02.00 | Receiving, checking and Marking (Unit) | Identify the types of procedures used in receiving, checking and marking merchandise for resale. Correctly enter information on purchasing and receiving documents. | 1.21 |
| 27.02.03.00 | Stockkeeping (Unit) | Identify the methods of storing, protecting, and accounting for merchandise in a stockroom. | 1.21 |
| 27.03.00.00 | Human Relations in Marketing (Course) | Identify the factors which promote good human relations in marketing occupations. | 1.24 |
| 27.03.01.00 | Basic Human Relations (Unit) | Identify the factors which promote good human relations in marketing occupations. Apply the factors which promote good human relations in a role-playing situation. | 1.24<br>3.00 |

MARKETING & DISTRIBUTION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 27.03.02.00 | Understanding Employer--Employee Relations (Unit) | Identify benefits an employee can offer to a business and the benefits a business can offer the employee. Apply the types of leadership and rules for communicating with your supervisor in a role-playing situation. | 1.12<br>3.00 |
| 27.04.00.00 | Marketing Mathematics (Course) | Perform accurately and speedily the required mathematical exercises and problems. | 3.00 |
| 27.04.01.00 | Application of Mathematics for Selling (Unit) | Accurately apply and perform basic mathematic skills. | 3.00 |
| 27.04.02.00 | Procedures for Inventory, Receiving Merchandise and Pricing (Unit) | Accurately perform the mathematical procedures and techniques necessary for inventory, receiving merchandise and pricing. | 3.00 |
| 27.05.00.00 | Cash Register Operation (Course) | Perform skillfully and accurately at the cash register in handling customers, ringing up an order, change procedures and bagging merchandise. | 3.00 |
| 27.05.01.00 | Face of Cash Register (Unit) | Perform skillfully and accurately the various cash register procedures and techniques. | 3.00 |
| 27.05.02.00 | Operating Checkout Station (Unit) | Accurately and skillfully perform the basic duties of a checker/cashier. | 3.00 |
| 27.05.03.00 | Checker/Cashier Qualities (Unit) | Identify the basic qualities necessary to be a successful checker/cashier. | 1.24 |
| 27.06.00.00 | Visual Merchandising (Course) | Identify fundamental merchandise display techniques. Plan and evaluate merchandise displays. | 1.21<br>5.20<br>6.10 |
| 27.06.01.00 | General Merchandise Display (Unit) | Identify examples of fundamental merchandise display techniques. Construct and evaluate merchandise displays. | 1.21<br>5.20<br>6.10 |

## MARKETING & DISTRIBUTION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 27.07.00.00 | Basic Salesmanship (Course) | Identify fundamentals of good salesmanship, and apply this knowledge in a simulated sales situation. | 1.21<br>3.00 |
| 27.07.01.00 | Steps of the Sale (Unit) | Identify and demonstrate the duties of a salesperson during a typical sale in a retail business. | 1.12<br>3.00 |
| 27.07.02.00 | Suggestion Selling (Unit) | Identify and demonstrate the techniques used in suggestion selling. | 1.25<br>3.00 |
| 27.08.00.00 | Customer Services (Course) | Identify the sales-supporting services provided by wholesale and retail businesses. | 1.21 |
| 27.08.01.00 | Credit (Unit) | Identify the credit and collection plans, policies, and procedures which are used by wholesale and retail businesses. | 1.21 |
| 27.08.02.00 | Shopping Services (Unit) | Identify the shopping conveniences provided by wholesale and retail businesses to their customers. | 1.21 |
| 27.09.00.00 | Advanced Salesmanship (Course) | Identify and demonstrate an understanding of advanced concepts and practices of good salesmanship and the ability to apply this knowledge in simulated sales situations. | 1.21<br>1.25<br>3.00 |
| 27.09.01.00 | Sales Preparation (Unit) | Given a choice of three different products, determine the buying motives, selling features and customer benefits for each product. | 4.10 |
| 27.09.02.00 | The Selling Process (Unit) | Given three products of your choice, compile sales information and preparation materials to be used in each of the four main stages of a typical sale. | 5.10 |
| 27.09.03.00 | Special Selling Techniques (Unit) | Given a list of retail and wholesale situations, determine the best sales approach or sales strategy to use is each situation. In a role-playing situation, demonstrate selling to either a wholesale or retail establishment. | 5.20<br>3.00 |

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 27.09.04.00 | Sales Management (Unit) | Given a retail or wholesale situation, identify the methods which might be used in evaluating and improving a sales person's sales performance. | 1.21 |
| 27.10.00.00 | Advertising and Promotion (Course) | Identify and demonstrate the fundamentals of advertising and sales promotion activities and construct an advertisement for a local newspaper. | 1.21<br>3.00 |
| 27.10.01.00 | Advertising Fundamentals (Unit) | Identify and demonstrate the fundamentals of advertising and an ability to plan and write an advertisement for a local newspaper. | 1.21 |
| 27.10.02.00 | Promotion (Unit) | Identify the fundamentals of sales promotion and public relation activities. | 1.21 |
| 27.11.00.00 | Purchasing (Course) | Identify the fundamentals of buying merchandise for resale or purchasing supplies for commercial food and beverage establishments. Calculate mathematical problems related to purchasing. | 1.21<br>3.00 |
| 27.11.01.00 | Merchandise Buying (Unit) | Identify the fundamentals of buying merchandise for resale. Calculate mathematical problems related to buying. | 1.21 |
| 27.11.02.00 | Food and Beverage Purchasing (Unit) | Identify the fundamentals of purchasing foods and beverages for a commercial food and beverage service establishment. | 1.21 |
| 27.12.00.00 | Business Finance and Control (Course) | Identify the fundamental concepts and practices used in business finance and control of costs. Demonstrate an ability to solve problems related to finance and cost control. | 1.21<br>3.00 |
| 27.12.01.00 | Fundamentals of Finance (Unit) | Identify and describe the fundamentals of business finance. Calculate mathematical problems related to business finance. | 1.21<br>3.00 |
| 27.12.02.00 | Merchandise Control (Unit) | Correctly use proper methods to control a merchandise inventory. | 3.00 |

## MARKETING & DISTRIBUTION (Continued)

| Page FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 27.12.03.00 | Food and Beverage Control (Unit) | Use proper methods to control a food and beverage inventory. | 3.00 |
| 27.13.00.00 | Supervisory Skills (Course) | Identify methods of solving and preventing human relations problems. | 1.21 |
| | | Solve human relations problems in a simulated situation. | 3.00 |
| 27.13.01.00 | Employee Training (Unit) | Given an occupation of your choice, write a training plan for a particular task performed by workers in the chosen occupation. Then, using the training plan you prepared, conduct a training session for the chosen task, using the instructor or another student as the trainee. (NOTE: The occupation and the task must be chosen with the consent of the instructor.) | 5.20<br>3.00 |
| 27.13.02.00 | Solving Human Relations Problems (Unit) | Given a situation involving a human relations problem in a business, decide on the proper action to take in solving the problem. | 5.30 |
| 27.13.03.00 | Preventing Human Relations Problems (Unit) | Given the "Four Keys to Good Human Relations," identify the most important factors or elements involved in obtaining the business conditions specified by each of the "Four Keys." | 1.21 |

## CURRICULUM COMPLETION CHARACTERISTICS

Number and percent of students validating. Validation of a curriculum area is defined by Mountain-Plains as the demonstration of mastery of each and all objectives of the component through cognitive and/or performance testing. Conditions of validation vary among areas but are constant among students for any given area. Prevalidation of a curriculum element (LAP, unit, course, or job title) is a special case in which the student demonstrates mastery of the element's objective prior to receiving formal preparation using Mountain-Plains curriculum products. For the purpose of this section, validation is viewed at the job title level. Table 3.2 contains completion statistics for all four curriculum areas in terms of job title completion and completion of support courses.

## Table 3.2

## Completion Rate By Curriculum Area and Marital Status

### a. Majors Only

| | 24 | | | | 25 | | | | 26 | | | | 27 | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | V | I | D | T | V | I | D | T | V | I | D | T | V | I | D | T | V | I | D | T |
| MHOH | 3 | 0 | 0 | 3 | 2 | 1 | 5 | 8 | 3 | 0 | 1 | 4 | 7 | 1 | 3 | 11 | 15 | 2 | 9 | 26 |
| Spouse | 54 | 3 | 23 | 80 | 3 | 1 | 2 | 6 | 7 | 0 | 3 | 10 | 11 | 1 | 3 | 15 | 75 | 5 | 31 | 111 |
| SHOH | 13 | 3 | 7 | 23 | 1 | 0 | 1 | 2 | 2 | 0 | 1 | 3 | 3 | 1 | 1 | 5 | 19 | 4 | 10 | 33 |
| Total | 70 | 6 | 30 | 106 | 6 | 2 | 8 | 16 | 12 | 0 | 5 | 17 | 21 | 3 | 7 | 31 | 109 | 11 | 50 | 170 |

### b. Support Only

| | 24 | | | | 26 | | | | 27 | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | V | I | D | T | V | I | D | T | V | I | D | T | V | I | D | T |
| MHOH | 9 | 3 | 12 | 24 | 1 | 1 | 6 | 8 | 3 | 1 | 7 | 11 | 13 | 5 | 25 | 43 |
| Spouse | 5 | 4 | 6 | 15 | 1 | 0 | 3 | 4 | 4 | 1 | 3 | 8 | 10 | 5 | 12 | 27 |
| SHOH | 5 | 3 | 1 | 9 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 3 | 8 | 3 | 2 | 13 |
| Total | 19 | 10 | 19 | 48 | 3 | 1 | 9 | 13 | 9 | 2 | 11 | 22 | 31 | 13 | 39 | 83 |

MHOH = Married Head of Household
SHOH = Single Head of Household

V = Validate
I = Incomplete
D = Non-Validate
T = Total

24 = Office Education
25 = Lodging
26 = Food Services
27 = Marketing & Distribution

A total of 170 students, including 26 married heads of household, 111 spouses, and 33 single heads of household, are enrolled in one of the four curriculum areas for occupational preparation. A chi-square analysis of Table 3.2a reveals a grouping phenomenon ($x_6^2 = 38.3$, $p < .01$). Spouses cluster in Office Education, and married heads of household cluster in Lodging. Single heads of household chose all four areas with nearly equal frequency, and all marital status groups were proportionately represented in Food Services. Basing expectations on total program population (157 married heads of household, 156 spouses, and 48 single heads of household), the four curriculum areas combined may be said to be dominated by spouses ($x_2^2 = 55.27$, $p < .001$). Married heads of household are under-represented (26 vs. 74 expected), and single heads are slightly over-represented (33 vs. 23 expected).

To date (as of April 1976), 11 of the 170 students (6.5%) were still enrolled in occupational preparation, and 13 students (15.7%) were still working toward completion of support areas. Therefore completion rates have been adjusted to reflect only the performances of students who have either validated or dropped out of the program without having validated. Table 3.3 contains both raw and adjusted completion rates for each curriculum area for area majors as well as for those students receiving support training.

## Table 3.3

## Adjusted Completion Rate by Curriculum Area and Marital Status

### a. Majors Only (Entries are Percentages)

| | 24 | | 25 | | 26 | | 27 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Raw | Adj | Raw | Adj | Raw | Adj | Raw | Adj | Raw | Adj |
| MHOH | 100 | 100 | 25 | 29 | 75 | 75 | 64 | 70 | 58 | 63 |
| Spouse | 68 | 70 | 50 | 60 | 70 | 70 | 73 | 79 | 68 | 71 |
| SHOH | 57 | 65 | 50 | 50 | 67 | 67 | 60 | 75 | 58 | 66 |
| Total | 66 | 70 | 38 | 43 | 71 | 71 | 68 | 75 | 64 | 69 |

### b. Support Only

| | 24 | | 26 | | 27 | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Raw | Adj | Raw | Adj | Raw | Adj | Raw | Adj |
| MHOH | 38 | 43 | 13 | 14 | 27 | 30 | 30 | 34 |
| Spouse | 33 | 45 | 25 | 25 | 50 | 57 | 37 | 45 |
| SHOH | 56 | 83 | 100 | 100 | 67 | 67 | 62 | 80 |
| Total | 40 | 50 | 23 | 25 | 41 | 45 | 37 | 44 |

It appears that the 69% overall, adjusted completion rate is fairly evenly spread among the three marital categories and all curriculum areas except Lodging (CA 25). However, the adjusted completion rate of 43% for Lodging does not vary significantly from the overall figure ($x_6^2 = 1.56$, $p > .10$), nor does any cell (e.g. married heads of household in Lodging) vary enough from an expected value of 69% to produce a significant effect. Upon further investigation, it was found that five of the fifty students in category D in Table 3.2a had merely dropped their original job title in preference for another job title within the Mountain-Plains program. All five have since validated their secondary job titles (four students chose job titles within the scope of this chapter; one student chose preparation as a Small Engines Mechanic in Curriculum Area 38). Thus the actual program completion rate is closer to 72% (71.7% as opposed to 68.6%).

Hours and cost characteristics. The amount of time a student spends in occupational preparation depends on the number of units he prevalidates and the rate at which he validates units once he enters the area. Each job title has an estimated number of hours required for completion. More precise time estimates are also available at the course, unit and LAP level. (However, these estimates serve only as guides, because no student is forced into a locked time frame.)

The data presented in Table 3.4 show by curriculum area and by job title the relationship among scheduled (budgeted) hours, attended hours and costs. Costs are derived from the Mountain-Plains Management Information Report (November, 1975) and are based on averages for the fiscal year ending 31 August 1975. These figures were chosen for their stability and relevance to the period of stabilization.

## Table 3.4

## Budgeted and Attended Hours

### CA 24 - Total Enrolled

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Clerk Steno | 22 | 418.6 | 18.8 | 278.3 | 203.0 | $2.50 | $ 695.75 |
| Clerk Typist | 35 | 223.4 | 24.6 | 162.1 | 100.5 | 2.50 | 405.25 |
| Bookkeeper | 24 | 333.0 | 18.4 | 211.8 | 147.5 | 2.50 | 529.50 |
| Keypuncher | 13 | 345.3 | 18.6 | 141.0 | 77.3 | 2.50 | 352.50 |
| Clerk | 4 | 120.2 | 21.5 | 142.2 | 84.1 | 2.50 | 355.50 |
| Accounting Clerk | 2 | 161.7 | 75.7 | 97.8 | 36.2 | 2.50 | 244.50 |
| ALL TITLES | 100 | 269.8 | 115.3 | 194.8 | 148.3 | 2.50 | 487.00 |
| Support for CA 25 | 13 | 61.1 | 7.7 | 54.5 | 48.4 | 2.50 | 136.25 |
| Support for CA 26 | 6 | 61.3 | 2.3 | 34.3 | 62.9 | 2.50 | 85.75 |
| Support for CA 27 | 16 | 172.0 | 0.0 | 152.9 | 103.5 | 2.50 | 382.25 |
| ALL SUPPORT | 35 | 116.6 | 56.3 | 96.0 | 94.8 | 2.50 | 240.00 |

Total Cost: $57,100.00

### CA 24 - Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Clerk Steno | 13 | 415.8 | 19.6 | 410.6 | 143.8 | $2.50 | $1,026.50 |
| Clerk Typist | 27 | 221.6 | 25.8 | 197.4 | 81.3 | 2.50 | 493.50 |
| Bookkeeper | 15 | 334.4 | 15.7 | 291.4 | 105.2 | 2.50 | 728.50 |
| Keypuncher | 11 | 102.0 | 19.5 | 155.9 | 74.3 | 2.50 | 389.75 |
| Clerk | 3 | 116.7 | 24.8 | 182.8 | 26.8 | 2.50 | 457.00 |
| Accounting Clerk | 1 | 75.0 | 0.0 | 69.5 | 0.0 | 2.50 | 173.75 |
| ALL TITLES | 70 | 251.4 | 108.4 | 248.2 | 134.6 | 2.50 | 620.50 |
| Support for CA 25 | 6 | 62.0 | 2.2 | 77.5 | 37.9 | 2.50 | 193.75 |
| Support for CA 26 | 3 | 61.3 | 2.3 | 68.7 | 79.7 | 2.50 | 171.75 |
| Support for CA 27 | 11 | 172.0 | 0.0 | 181.6 | 85.7 | 2.50 | 454.00 |
| ALL SUPPORT | 20 | 122.4 | 56.3 | 133.4 | 88.9 | 2.50 | 333.50 |

Total Cost: $50,100.00

*Adjusted enrollment figures reflect only those students no longer enrolled.

Table 3.4 (Continued)

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| **CA 24 - Non-Validators** | | | | | | | |
| Clerk Steno | 9 | 419.2 | 17.8 | 87.2 | 87.2 | $2.50 | $ 218.00 |
| Clerk Typist | 8 | 225.5 | 22.4 | 43.1 | 59.5 | 2.50 | 107.75 |
| Bookkeeper | 9 | 329.0 | 23.0 | 78.9 | 107.0 | 2.50 | 197.25 |
| Keypuncher | 2 | 112.5 | 8.5 | 59.0 | 16.0 | 2.50 | 147.50 |
| Clerk | 1 | 131.0 | 0.0 | 20.5 | 0.0 | 2.50 | 51.25 |
| Accounting Clerk | 1 | 215.0 | 0.0 | 130.0 | 0.0 | 2.50 | 325.00 |
| ALL TITLES | 30 | 303.6 | 101.0 | 70.3 | 81.6 | 2.50 | 175.75 |
| Support for CA 25 | 7 | 59.9 | 11.0 | 34.8 | 50.2 | 2.50 | 87.00 |
| Support for CA 26 | 3 | 61.3 | 2.3 | 0.0 | 0.0 | 2.50 | 0.00 |
| Support for CA 27 | 5 | 172.0 | 0.0 | 89.9 | 120.8 | 2.50 | 224.75 |
| ALL SUPPORT | 15 | 97.5 | 55.0 | 46.2 | 80.3 | 2.50 | 115.50 |
| | | | | | | Total Cost: | $7,000.00 |
| **CA 25 - Total Enrolled** | | | | | | | |
| Asst. Manager Trainee | 12 | 364.4 | 55.1 | 159.6 | 147.4 | $3.15 | $502.74 |
| Desk Clerk | 2 | 161.0 | 21.0 | 124.6 | 46.6 | 3.15 | 392.49 |
| ALL TITLES | 14 | 330.8 | 89.2 | 154.6 | 137.4 | 3.15 | 486.99 |
| | | | | | | Total Cost: | $6,817.86 |
| **CA 25 - Validators** | | | | | | | |
| Asst. Manager Trainee | 5 | 336.4 | 62.4 | 312.0 | 76.7 | $3.15 | $982.80 |
| Desk Clerk | 1 | 182.0 | 0.0 | 171.2 | 0.0 | 3.15 | 539.28 |
| ALL TITLES | 6 | 310.7 | 84.2 | 288.5 | 89.5 | 3.15 | 908.78 |
| | | | | | | Total Cost: | $5,452.74 |

*Adjusted enrollment figures reflect only those students no longer enrolled.

## Table 3.4 (Continued)

### CA 25 - Non-Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Asst. Manager Trainee | 7 | 379.6 | 48.8 | 50.8 | 52.5 | $3.15 | $160.02 |
| Desk Clerk | 1 | 140.0 | 0.0 | 78.0 | 0.0 | 3.15 | 245.70 |
| ALL TITLES | 8 | 349.6 | 96.0 | 54.2 | 49.5 | 3.15 | 170.73 |

Total Costs: $1,365.12

### CA 26 - Total Enrolled

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Second Baker | 4 | 333.0 | 6.4 | 131.6 | 117.0 | $5.23 | $ 688.27 |
| Chef Trainee | 3 | 318.7 | 4.8 | 135.0 | 87.5 | 5.23 | 706.05 |
| Restaurant Mgr. Trainee | 5 | 302.4 | 1.3 | 139.2 | 89.2 | 5.23 | 728.02 |
| Restaurant Cook | 1 | 252.0 | 0.0 | 226.5 | 0.0 | 5.23 | 1,184.60 |
| Institutional Cook | 3 | 249.7 | 1.2 | 122.0 | 104.2 | 5.23 | 638.06 |
| Bakery Mgr. Trainee | 1 | 339.0 | 0.0 | 0.0 | 0.0 | 5.23 | 0.00 |
| ALL TITLES | 17 | 302.4 | 29.5 | 130.6 | 92.5 | 5.23 | 682.95 |
| Support for CA 25 | 12 | 56.4 | 1.0 | 16.2 | 27.3 | 5.23 | 84.73 |

Total Costs: $12,626.91

### CA 26 - Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Second Baker | 3 | 331.0 | 6.1 | 175.5 | 94.9 | $5.23 | $ 917.86 |
| Chef Trainee | 2 | 316.5 | 4.5 | 185.5 | 1.5 | 5.23 | 970.16 |
| Restaurant Mgr. Trainee | 4 | 302.3 | 1.5 | 174.0 | 50.3 | 5.23 | 910.02 |
| Restaurant Cook | 1 | 252.0 | 0.0 | 226.5 | 0.0 | 5.23 | 1,184.60 |
| Institutional Cook | 2 | 249.0 | 0.0 | 181.8 | 11.7 | 5.23 | 950.81 |
| Bakery Mgr. Trainee | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.23 | 0.00 |
| ALL TITLES | 12 | 298.8 | 31.7 | 182.0 | 50.7 | 5.23 | 951.86 |
| Support for CA 25 | 3 | 57.0 | 0.0 | 46.0 | 30.3 | 5.23 | 240.58 |

Total Costs: $12,144.12

*Adjusted enrollment figures reflect only those students no longer enrolled.

Table 3.4 (Continued)

CA 26 - Non-Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Second Baker | 1 | 339.0 | 0.0 | 0.0 | 0.0 | $5.23 | $ 0.00 |
| Chef Trainee | 1 | 323.0 | 0.0 | 34.0 | 0.0 | 5.23 | 117.82 |
| Restaurant Mgr. Trainee | 1 | 303.0 | 0.0 | 0.0 | 0.0 | 5.23 | 0.00 |
| Restaurant Cook | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.23 | 0.00 |
| Institutional Cook | 1 | 251.0 | 0.0 | 2.5 | 0.0 | 5.23 | 13.08 |
| Bakery Mgr. Trainee | 1 | 339.0 | 0.0 | 0.0 | 0.0 | 5.23 | 0.00 |
| ALL TITLES | 5 | 311.0 | 24.4 | 7.3 | 15.0 | 5.23 | 38.18 |
| Support for CA 25 | 9 | 56.1 | 1.1 | 6.2 | 18.7 | 5.23 | 32.43 |

Total Costs: $482.79

CA 27 - Total Enrolled

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Mid-Mgt. Trainee | 17 | 434.5 | 24.8 | 312.6 | 151.5 | $0.99 | $309.47 |
| Pro. Salesperson | 5 | 359.0 | 0.0 | 227.0 | 153.5 | 0.99 | 224.73 |
| Checker/Cashier | 4 | 165.0 | 0.0 | 111.9 | 69.4 | 0.99 | 110.78 |
| General Salesperson | 2 | 226.5 | 8.5 | 226.0 | 87.5 | 0.99 | 223.74 |
| ALL TITLES | 28 | 374.1 | 100.7 | 262.5 | 153.2 | 0.99 | 259.88 |
| Support for CA 25 | 12 | 50.0 | 0.0 | 22.0 | 41.3 | 0.99 | 21.78 |
| Support for CA 26 | 5 | 57.0 | 12.4 | 26.0 | 28.5 | 0.99 | 25.74 |
| ALL SUPPORT | 17 | 52.2 | 7.3 | 23.2 | 37.1 | 0.99 | 22.97 |

Total Costs: $7,667.10

*Adjusted enrollment figures reflect only those students no longer enrolled.

### Table 3.4 (Continued)

#### CA 27 - Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Mid-Mgt. Trainee | 12 | 424.8 | 28.3 | 371.0 | 99.8 | $0.99 | $367.29 |
| Pro. Salesperson | 3 | 359.0 | 0.0 | 271.0 | 145.2 | 0.99 | 268.29 |
| Checker/Cashier | 4 | 165.0 | 0.0 | 111.9 | 69.4 | 0.99 | 110.78 |
| General Salesperson | 2 | 226.5 | 8.5 | 226.0 | 87.5 | 0.99 | 223.74 |
| ALL TITLES | 21 | 347.0 | 110.3 | 293.6 | 140.8 | 0.99 | 290.65 |
| Support for CA 25 | 4 | 50.0 | 0.0 | 66.0 | 48.7 | 0.99 | 65.34 |
| Support for CA 26 | 3 | 65.0 | 0.0 | 43.3 | 22.2 | 0.99 | 42.87 |
| ALL SUPPORT | 7 | 56.4 | 8.0 | 56.3 | 38.7 | 0.99 | 55.71 |

Total Costs: $6,493.59

#### CA 27 - Non-Validators

| Job Title | Enrolled* | Mean Budgeted Hours | S.D. | Mean Attended Hours | S.D. | Cost/Hour | Cost/Student |
|---|---|---|---|---|---|---|---|
| Mid-Mgt. Trainee | 5 | 449.0 | 0.0 | 172.6 | 172.1 | $0.99 | $170.87 |
| Pro. Salesperson | 2 | 359.0 | 0.0 | 161.0 | 137.0 | 0.99 | 159.39 |
| Checker/Cashier | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.99 | 0.00 |
| General Salesperson | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.99 | 0.00 |
| ALL TITLES | 7 | 423.3 | 43.9 | 169.3 | 161.3 | 0.99 | 167.64 |
| Support for CA 25 | 8 | 50.0 | 0.0 | 0.0 | 0.0 | 0.99 | 0.00 |
| Support for CA 26 | 2 | 53.0 | 12.0 | 0.0 | 0.0 | 0.99 | 0.00 |

Total Costs: $1,173.51

#### GRAND TOTAL

| Total Budgeted Hours | Total Attended Hours | Total Cost | Total Cost/Hour | Total Cost for Validators | Total Cost for Non-Validators |
|---|---|---|---|---|---|
| 56,022 | 34,220.2 | $84,211.87 | $2.46 | $74,190.45 | $10,021.42 |

*Adjusted enrollment figures reflect only those students no longer enrolled.

The total cost figures for each curriculum area are obtained by adding the total cost of job title preparation in each area to the cost of support to other areas rendered by a particular curriculum area. Thus, for example, the combined costs incurred in training 100 individuals from assorted job titles in Office Education was $48,700. The cost of support for 13 students in Lodging was $1,770.00. Costs for Food Service and Marketing & Distribution were $514.00 and $6,116.00, respectively. The total expenditure of CA 24 on 135 students was $57,100. While this entire sum is charged to Office Education's budget, it is helpful both internally and externally to note that approximately 15% of this amount is directly attributable to the activities of other curriculum areas.

In order to determine the accuracy of job title time estimates, a comparison of budgeted versus attended hours for validators was made. For all job titles combined, attended hours was equal to 90.5% of budgeted hours. In Office Education hours were matched even more closely (98.7% of budget). The ratio of attended to budgeted hours was 92.89% in Lodging, 60.9% in Food Service, and 84.6% in Marketing & Distribution. The only instance in which a critical examination of time estimates seems warranted is in Food Service.

Table 3.4 contains cost information pertaining to major area and support areas. Total costs for some job titles are therefore computed by adding all costs for those job titles (see Appendix A for a complete description of support area requirements). Thus, for example, the average cost for a completing Assistant Manager Trainee is $1,482.47. Four other job titles are summed as follows:

| | |
|---|---|
| Desk Clerk | $ 586.24 |
| Restaurant Manager Trainee | $1,124.64 |
| Chef Trainee | $1,013.03 |
| Mid-Management Trainee | $ 749.54 |

Bakery Manager Trainee also requires support (CA 24 and 27), but no completers were produced. Therefore, no completion costs were computed for this job title. All other job titles received no support; hence, completion costs may be read directly from Table 3.4.

Examination of the Grand Totals in Table 3.4 reveals that, although non-validators constitute about 30% of the students enrolled, costs for non-validators account for only about 12% of the total expenditure of $84,211.87. This difference may be accounted for by the difference in attended time between validators and non-validators. Had non-validators remained in occupational preparation as many hours as validators, the total cost would have been $99,578.05, or an increase of $15,366.18.

## SOCIODEMOGRAPHIC CHARACTERISTICS

The 170 students enrolled in either Office Education, Lodging, Food Service, or Marketing & Distribution, were members of a stabilization population of 361 students (cf Chapter I). All students had responded to an extensive personal questionnaire prior to program entry. Much of the information received may be classified under three broad headings: Education, Employment/Income and Quality of Life. The presentation in these sections will allow for comparisons among curriculum areas with respect to the characteristics of the individuals enrolled in them.

Education variables. Variables in this category include age, years of formal education, and scores on the quantitative and verbal sections of the Wide Range Achievement Test (WRAT). Age ranges were from 23 to 32 for MHOH, 21 to 27 for spouses and 25 to 26 for SHOH. The three marital status groups were fairly similar, in most respects, to their cohorts in the stabilization population. The only major differences were among curriculum areas within a particular group. Significant age differences were revealed among MHOH when grouped by curriculum area (F = 31.4; df = 2, 19; $p < .01$). Males in Food Service tend to be much older than those in Marketing & Distribution. Among spouses, significant differences in WRAT verbal scores were detected (F = 1402.0; df = 3,110; $p < .01$). Major sources of this variance are Food Service (low of 9.6) and Office Education (high of 13.6). No meaningful differences were detected among single heads. In general, educational attainment was about 11 years for all students. This estimate is fairly close to the one reported in Chapter I (10.86 years for HOH and 10.91 years for spouses).

Work/Income. Variables included in this category are weeks unemployed, total income, monthly salary from last job, AFDC payments, welfare benefits, and unemployment compensation. Students in the stabilization population generally report little income from these last three sources (with the exception of single heads, many of whom report AFDC payments). The heads of household in CA 24, 25, 26, and 27, are typical in this respect. The total incomes for married heads of household fall into the \$4,000 - \$5,000 range except for those in Food Service. The median reported income of \$2,668 is quite low comparatively.

Single heads of household reported much lower annual incomes (median = \$1,110). However, nearly 60% reported receiving AFDC payments (approximately \$525 per recipient). Little or no income was reported from other sources.

Spouses in Office Education constitute a fairly large portion of the stabilization population (22%) and warrant some special attention.

Median annual family income was $4,023.62 (within the median range of the stabilization population). The spouse's contribution to total family income was rather substantial (averaging nearly $1,100); 81% had been employed full time as opposed to 33% in the total student population.

Quality of life. Quality of life encompasses size of household, cost of food stamps, face value of food stamps, debts, housing and utility payments, and value of housing subsidies. Families represented by the 111 spouses are fairly typical of the stabilization population, primarily because they constitute the bulk of that population. Rents were fairly consistent across the three marital status groups and the four curriculum areas, averaging $50 - $75 per month. Utilities were approximately $20 per month. Both these figures are very close to those reported in Chapter I ($61.43 per month for housing and $21.32 per month for utilities).

There were major differences among the families represented by the three marital status groups with respect to indebtedness ($F = 7.2$; df = 2,7; $p < .05$). Unweighted means were $480.72 for SHOH, $817.13 for the 111 families represented in the four curriculum areas by spouses, and $1,104.51 for MHOH. The 59 families represented by MHOH and SHOH appear to be fairly typical of the stabilization population which had a mean indebtedness of about $700 per family.

Summary. Individuals enrolled in the Office Education and Marketing & Tourism areas are, with the few exceptions noted, representative of Mountain-Plains students in general. Prior educational attainment, family income, and quality of life variables, are all consistent with characteristics reported in Chapters I and II. Major exceptions include the evident heightened involvement in the family's economic viability on the part of spouses enrolled in Office Education, some anomalies with regard to male heads in the Food Service area, and the large differences in verbal achievement between spouses in Office Education and spouses in Food Service.

## CONCLUSION

The four curriculum areas comprising Office Education and Marketing & Tourism had a total enrollment of 170 students, nearly half the stabilization population. The largest single area of enrollment was Office Education with 106 students. A completion rate of approximately 70% (71.7%) was attained and was fairly evenly spread among the three marital status groups and the four curriculum areas. Those who completed did so by mastering objectives which were well stated, pertinent, and variable enough in complexity to allow for fairly continuous progression. Further evaluation of these areas in Volume II should provide very little difficulty except for small sample size in some job titles. Documentation of the few departures from population norms (e.g. the discrepancy between estimated and attended hours in Food Services) should be of value to subsequent internal evaluations.

## Appendix A
## Job Title Objectives and Requirements

### Curriculum Area 24 - Office Education

### KEYPUNCH OPERATOR

Objectives:

Perform routine keypunching duties following established methods and procedures. Keypunch 10,000 character strokes per hour (maximum error 1.4%). Type 40 wpm (maximum of 3 errors on a 5 minute test).

Requirements:

24.06.01
24.06.02
24.06.03
24.06.04
24.06.05
24.10.01
24.10.02
24.10.03
24.10.04
24.10.5B
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B

### CLERK

Objectives:

Perform routine clerical duties that include the use of the typewriter, duplicating machines and adding machines. Type 40 wpm (maximum of 3 errors on a 5 minute test).

Requirements:

24.03.01
24.03.02
24.08.01
24.13.01
24.13.02
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B
24.18.01
24.18.02
24.18.04

### CLERK TYPIST

Objectives:

Perform varied clerical duties that include effective use of the typewriter, duplicating machines, adding machines and calculators. Type 50 wpm (maximum of 3 errors on a 5 minute test).

Requirements:

24.02.01
24.02.02
24.03.01
24.03.02
24.04.01
24.04.02
24.05.01
24.05.02
24.05.03
24.05.04
24.08.01
24.13.01
24.13.02
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B
24.18.01
24.18.02
24.18.03
24.18.04
24.18.05
24.18.06
24.19.01
24.19.02
24.19.03
24.19.04
24.19.05

## CLERK STENOGRAPHER

Objectives:

Take and transcribe dictation at commercial speeds; type 60 wpm (maximum of 3 errors on a 5 minute test); type assignments accurately from written and audio recorded transcriptions; use adding machines and calculators; prepare correspondence using effective communication techniques; make opening, adjusting and closing entries in journals, ledgers and basic payroll records; and perform office operational tasks like mail handling, data handling, duplicating, filing and card keypunching.

Requirements:

24.01.01
24.01.02
24.01.03
24.01.04
24.02.01
24.02.02
24.03.01
24.03.02
24.04.01
24.04.02
24.05.01
24.05.02
24.05.03
24.05.04
24.08.01
24.10.01
24.10.02
24.13.01
24.13.02
24.15.01
24.15.02
24.16.01
24.16.02
24.16.03
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B
24.18.01
24.18.02
24.18.03
24.18.04
24.18.05
24.18.06
24.19.01
24.19.02
24.19.03
24.19.04
24.19.05
24.21.01
24.21.02
24.21.04
24.21.05

## ACCOUNTING CLERK

Objectives:

Perform routine accounting duties following established methods and procedures. Use adding machines and calculators. Type 30 wpm (maximum of 3 errors on a 5 minute test).

Requirements:

24.01.01
24.01.02
24.01.03
24.01.04
24.03.01
24.03.02
24.04.01
24.04.02
24.05.01
24.05.02
24.05.03
24.05.04
24.08.01
24.13.01
24.13.02
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B

## BOOKKEEPER

Objectives:

Analyze, classify, record and summarize data for or about an accounting system; use effective communication techniques in business correspondence; use ten-key and full-keyboard adding machines, printing and electronic calculators; file cards and correspondences; keypunch cards; attain a typing speed of 30 wpm (maximum of 3 errors on a 5 minute test) and type assignments accurately to specified standards.

Requirements:

24.01.01
24.01.02
24.01.03
24.01.04
24.01.05
24.01.06
24.01.07
24.02.01
24.03.01
24.03.02
24.04.01
24.04.02
24.05.01
24.05.02
24.05.03
24.05.04
24.08.01
24.10.01
24.10.02
24.13.01
24.13.02
24.17.01
24.17.02
24.17.03
24.17.04
24.17.5B
24.17.05

## Curriculum Area 25 - Lodging

### MAID

Objectives:

Clean and replenish with supplies, each type of room in the hotel/motel following procedures that maintain the desired standards of appearance, sanitation, safety and security.

Requirements:

25.01.01

### SUPERVISORY HOUSEKEEPER

Objectives:

Provide housekeeping services that meet desired standards of appearance, sanitation, safety and security for a hotel/motel by applying functional information, supervisory concepts and management practices to staff, equipment, materials and supplies.

Requirements:

25.01.01
25.01.02
25.01.03
25.01.04
25.01.05
25.01.06
25.01.07

### DESK CLERK

Objectives:

Check guests in and out of hotel/motels using appropriate forms, equipment and procedures.

Requirements:

25.02.01
25.02.02
25.02.03
25.02.04

### NIGHT AUDITOR

Objectives:

Perform the function of a desk clerk and prepare an audit of the hotel/motel daily transactions either manually or with various machines.

Requirements:

25.02.01
25.02.02
25.02.03
25.02.04
25.03.01
25.03.02
25.03.03
25.03.04
24.03.01*
24.03.02*

*Support

### ASSISTANT MANAGER TRAINEE

Objectives:

Identify, describe and apply the hotel/motel management functions involving facilities, supplies, equipment, staff and guest services.

Requirements:

25.01.01
25.02.01
25.02.02
25.02.03
25.02.04
25.03.01
25.03.02
25.03.03
25.03.04
24.03.01*
24.03.02*
26.01.01*
26.04.01*
27.11.02*
27.12.01*
27.12.03*

*Support

## Curriculum Area 26 - Food Service

### RESTAURANT COOK

Objectives:

Prepare, portion and garnish food for meals, commonly served in restaurants, that meet desired quality standards of taste and visual appeal.

Requirements:

26.01.01
26.01.02
26.02.01
26.03.01

### INSTITUTIONAL COOK

Objectives:

Prepare foods in large quantities for meals, commonly served in institutions, that meet desired quality standards of taste and visual appeal.

Requirements:

26.01.01
26.01.02
26.02.01
26.03.01

## KITCHEN SUPERVISOR TRAINEE

Objectives:

Plan, prepare and provide food and beverages, in large quantities, for meals commonly served in an institutional setting. Identify and describe the institutional food service supervisory functions.

Requirements:

26.01.01
26.01.02
26.02.01
26.03.01
27.11.02*
27.14.02*

*Support

## SECOND BAKER

Objectives:

Prepare bakery products following recipes and using appropriate equipment and procedures.

Requirements:

26.01.01
26.01.02
26.06.01

## BAKERY MANAGER TRAINEE

Objectives:

Plan, prepare, and provide bakery products in a bakery setting. Identify and describe the bakery management functions involving facilities, supplies, equipment, staff and customer services.

Requirements:

26.01.01
26.01.02
26.06.01
24.01.01*
24.01.02*
24.01.04*
24.03.01*
24.03.02*
27.04.02*
27.11.02*
27.12.01*

*Support

## RESTAURANT MANAGER TRAINEE

### Objectives:

Plan, prepare, and provide food and beverage service for guests in a restaurant table and banquet settings. Identify and describe the restaurant food service management functions involving facilities, supplies, equipment, staff and guest services.

### Requirements:

26.01.01
26.01.02
26.03.01
26.04.01
24.01.01*
24.01.02*
24.01.04*
24.03.01*
24.03.02*
27.04.02*
27.11.02*
27.12.01*
27.12.03*

*Support

## CHEF TRAINEE

### Objectives:

Plan, prepare, and provide food and beverage for banquets and buffet services. Prepare gourmet dishes.

### Requirements:

26.01.01
26.01.02
26.02.01
26.03.01
26.05.01
27.04.02*
27.11.02*
27.12.03*

*Support

## SECOND BAKER

### Objectives:

Prepare bakery products following recipes and using appropriate equipment and procedures.

### Requirements:

26.01.01
26.01.02
26.06.01

# Curriculum Area 27 - Marketing & Distribution

## SHIPPING AND RECEIVING CLERK

Objectives:

Interpret and complete documents needed to process merchandise for shipping, receiving, checking, marking, storing, protecting and accounting.

Requirements:

27.01.01
27.01.02
27.01.03
27.02.01
27.02.02
27.02.03
27.03.01
27.03.02
27.04.02

## CHECKER/CASHIER

Objectives:

Perform merchandise check-out procedures at a cash register. Interpret and completes documents needed to process merchandise for shipping, receiving, checking, marking, storing, protecting and accounting.

Requirements:

27.01.01
27.01.02
27.01.03
27.02.01
27.02.02
27.02.03
27.03.01
27.03.02
27.04.01
27.04.02
27.05.01
27.05.02
27.05.03

## GENERAL SALESPERSON

Objectives:

Perform various stages of a merchandise sale to serve the customer efficiently and correctly.

Requirements:

27.01.01
27.01.02
27.01.03
27.02.01
27.02.02
27.02.03
27.03.01
27.03.02
27.04.01
27.04.02
27.05.01
27.05.02
27.05.03
27.06.01
27.07.01
27.07.02
27.08.01
27.08.02

## PROFESSIONAL SALESPERSON

Objectives:

Effectively manage time to:

> Plan and construct merchandise displays. Plan and prepare advertisements and sales promotion. Maintain and expand customer prospect files. Determine customer needs, demonstrate products, and with efficiency, correctly serve the customer during various stages of a sale.

Requirements:

27.01.01
27.01.02
27.01.03
27.02.01
27.02.02
27.02.03
27.03.01
27.03.02
27.04.01
27.04.02
27.05.01
27.05.02
27.05.03
27.06.01
27.07.01
27.07.02
27.08.01
27.08.02
27.09.01
27.09.02
27.09.03
27.09.04
27.10.01
27.10.02

## MID-MANAGEMENT TRAINEE

Objectives:

Identify the concepts, principles and practices involved with the operation of wholesale and retail merchandise businesses.

Requirements:

27.01.01
27.01.02
27.01.03
27.02.01
27.02.02
27.02.03
27.04.01
27.04.02
27.05.01
27.05.02
27.05.03
27.06.01
27.07.01
27.07.02
27.08.01
27.08.02
27.09.01
27.09.02
27.09.03
27.09.04
27.10.01
27.10.02
27.11.01
27.12.01
27.12.02
27.13.01
27.13.02
27.13.03
24.01.01*
24.01.02*
24.01.03*
24.01.04*
24.01.05*
24.01.06*

*Support

# Appendix B
# Bloom's Taxonomy of Behavioral Objectives[1]
# (Cognitive Domain)

## Knowledge

- 1.00 Knowledge. Recall of information.
- 1.10 Knowledge of specifics. Emphasis is on symbols with concrete referents.
  - 1.11 Knowledge of terminology.
  - 1.12 Knowledge of specific facts.

- 1.20 Knowledge of ways and means of dealing with specifics. Includes methods of inquiry, chronological sequences, standards of judgment, patterns of organization within a field.
  - 1.21 Knowledge of conventions: accepted usage, correct style, etc.
  - 1.22 Knowledge of trends and sequences.
  - 1.23 Knowledge of classifications and categories.
  - 1.24 Knowledge of criteria.
  - 1.25 Knowledge of methodology for investigating particular problems.

- 1.30 Knowledge of the universals and abstractions in a field. Patterns and schemes by which phenomena and ideas are organized.
  - 1.31 Knowledge of principles and generalizations.
  - 1.32 Knowledge of theories and structures (as a connected body of principles, generalizations, and interrelations).

## Intellectual Skills and Abilities

- 2.00 Comprehension. Understanding of material being communicated, without necessarily relating it to other material.
  - 2.10 Translation. From one set of symbols to another.
  - 2.20 Interpretation. Summarization or explanation of a communication.
  - 2.30 Extrapolation. Extension of trends beyond the given data.

- 3.00 Application. The use of abstractions in particular, concrete situations.

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[1] Adapted from D.L. Krathwohl, stating objectives appropriately for program, for curriculum, and for instructional materials development. Journal of Teacher Education, 1965, 16, 83-92; also appearing in D.E. Payne (Ed.) Curriculum Evaluation. Lexington, Mass.: D.C. Heath & Co., 1974, under the title "Stating Appropriate Educational Objectives," pp. 69-80.

4.00 Analysis. Breaking a communication into its parts so that origianization of ideas is clear.

- 4.10 Analysis of elements. That is, recognizing assumptions.
- 4.20 Analysis of relationships. Content or mechanical factors.
- 4.30 Analysis of organizational principles. What holds the communication together?

5.00 Synthesis. Putting elements into a whole.

- 5.10 Production of a unique communication.
- 5.20 Production of a plan for operations.
- 5.30 Derivation of a set of abstract relations.

6.00 Evaluation. Judging the value of material for a given purpose.

- 6.10 Judgment in terms of internal evidence; e.g., logical consistency.
- 6.20 Judgments in terms of external evidence; e.g., consistency with facts developed elsewhere.

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN-PLAINS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER IV - BUILDING TRADES

JULY 1976

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN-PLAINS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER IV - BUILDING TRADES

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July 1976

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David A. Coyle, Director
David L. Irving, Editor

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Instructional/Curriculum Evaluation constitutes one aspect of the evaluative process of Mountain-Plains. Reports in this series, together with reports from External and Affective evaluation series, will provide a thorough documentation of the processes and products of Mountain-Plains. Major subdivisions of the series include:

1. User Trial Reports
2. Descriptive Characteristics
3. Summative Analysis
4. Reliability and Validity Studies
5. Student Evaluation of Staff and Curriculum

Individual reports in each series are currently available from, or are in the process of being incorporated into, the ERIC retrieval system. By the conclusion of the NIE research cycle, Instructional/Curriculum Evaluation Reports will number about 40 or 50. Many reports span two or more areas. These include overall internal evaluation reports and reports on the effects of affective variables on cognitive performance.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program research, and requires some indulgence on the part of the reader.

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# CHAPTER IV
# BUILDING TRADES

Mountain-Plains has ten curriculum areas which collectively comprise Building Trades. Each curriculum area deals with one or more aspects of construction, repair, or service, in occupations traditionally classified as Trades. These areas include Carpentry (CA70), Electronic Assembly (CA71), Electrical Wiring (CA72), Plumbing (CA73), Heating Systems Service (CA74), Refrigeration/Cooling Systems Service (CA75), Appliance Service (CA76), Radio & TV Repair (CA77), Electric Motor Repair (CA78), and Drafting (CA79). The purpose of the present chapter is to describe these curriculum areas in terms of their objectives, completion characteristics, and characteristics of the students within each area.

## OBJECTIVES

Each curriculum area is composed of one or more courses, which are in turn made up of units; and lastly, the ultimate division is the Learning Activity Package (LAP). Each course, unit and LAP, has its own specific objective. Objectives down to the unit level are described in Table 4.1. Complexity of activity involved in a particular course or unit is described by the Bloom Code number on the right of the page. These code numbers are explained in detail in Appendix A.

## Table 4.1
## Building Trades Objectives

### CURRICULUM AREA 70: CARPENTRY

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM[1] CODE |
|---|---|---|---|
| 70.01.00.00 | Rough-In (Course) | Given a blueprint and specifications, students layout, determine, obtain, prepare, and assemble the materials required to complete the framing and forming requirements for a specified structure. | 5.20 |
| 70.01.01.00 | Excavation Layout-Concrete and Forms (Unit) | Provided with resources giving the methods, the tools, the materials, and the equipment for construction, you will: | |
| | | 1. Relate information about concrete use and handling to concrete forming. | 1.31 |
| | | 2. Construct and assemble various types of forms like footings, foundations, columns, walk, slabs, and steps. The direction for construction is provided by sketches, prints, and specifications. | 3.00 |
| | | 3. Demonstrate acceptable ways to anchor construction materials to concrete. | 3.00 |
| | | 4. Prepare a building site for excavation and placement of concrete foundation elements. | 5.20 |
| 70.01.02.00 | Floor and Wall Framing (Unit) | Given specifications, tools, equipment, and materials, you will: | |
| | | 1. Identify parts for components included in framing wall and floor construction. | 1.12 |
| | | 2. Determine the material requirements for floor and wall framing. | 5.20 |
| | | 3. Assemble and lay out the materials for floor and wall framing jobs. | 5.20 |
| | | 4. Assemble and install framing for floors and walls. | 3.00 |
| 70.01.03.00 | Ceiling Framing (Unit) | Given tools, equipment, materials and construction specifications, you will: | |
| | | 1. Sketch the support components for ceiling sections. | 5.10 |
| | | 2. Determine material requirements for ceiling framing jobs. | 1.24 |
| | | 3. Lay out the location of the ceiling framing components. | 5.20 |
| | | 4. Prepare, assemble and install the ceiling framing components. | 3.00 |

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[1] See Appendix A.

## CARPENTRY (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 70.01.04.00 | Roof (Unit) | Given tools, equipment, materials, and the construction prints and specifications, the student will: | |
| | | 1. Use the basic terms for parts and dimensions in roof construction. | 1.11 |
| | | 2. Lay out, cut, and install various types of roof construction components. | 5.20 |
| | | 3. Determine the material needs for a roof construction. | 5.20 |
| 70.02.00.00 | Finish (Course) | Prepare and install interior and exterior finish portions of a structure according to given specifications using appropriate tools and procedures. | 3.00<br>2.20 |
| 70.02.01.00 | Matching Processes (Unit) | Given the tools, equipment, materials, construction prints and specifications, the student will shape, cut to size, bore and finish woodstock using machine processes as specified for the job. | 3.00<br>2.20 |
| 70.02.02.00 | Exterior Wall Coverings and Cornice (Unit) | Given the construction prints and specifications, tools, equipment, and materials, the student will: | |
| | | 1. Sketch cornice details for a job. | 5.10 |
| | | 2. Determine the material needs for the exterior wall covering. | 5.20 |
| | | 3. Install various wall coverings and cornice components for a job. | 3.00 |
| 70.02.03.00 | Windows and Trim (Unit) | The student will determine the type of windows required from construction prints and specifications. Windows will be installed according to the prints and specifications using appropriate tools, equipment and materials. | 5.20<br>3.00 |
| 70.02.04.00 | Interior Coverings (Unit) | You will install specified interior coverings and trims to complete the job as given on construction prints and in specifications with needed tools, equipment and materials. | 3.00 |
| 70.02.05.00 | Doors and Jambs (Unit) | Given construction prints and/or specifications, tools, equipment, and materials, you will: | |
| | | 1. Determine materials needed for a door installation. | 1.24 |
| | | 2. Identify the parts of a door. | 1.11 |
| | | 3. Prepare a door opening, hang the door, and complete the installation as specified. | 3.00 |

## CURRICULUM AREA 71: ELECTRONIC ASSEMBLY

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 71.01.00.00 | Preparation for Electronic Assembly (Course) | Safely use tools and equipment to mechanically, electrically, and microelectronically install components in and remove them from electronic devices and wire harnesses according to given specifications at an assembly workstation. Perform inspections and make evaluations of soldering connections and electronic circuits using techniques and test equipment that determine the quality of assembly. Sketch various electronic diagrams about electronic devices. | 3.00<br>6.10<br>5.10 |
| 71.01.01.00 | Component Identification (Unit) | Name the components and component parts used in electronic and mechanical assembly and classify by type and function. Determine component characteristics by interpreting component markings. Use semiconductor and tube manuals for determining component characteristics. Recognize and draw schematic symbols for electronic components. | 1.11<br>1.23<br>1.21 |
| 71.01.02.00 | Diagrams (Unit) | Identify, read, and sketch electronic schematic, symbolic, block, wiring and layout diagrams. | 1.11<br>5.10 |
| 71.01.03.00 | Tools and Equipment (Unit) | Safely use appropriate tools and equipment for mechanical, electrical, and microelectronic assembly of electronic devices. | 3.00 |
| 71.01.04.00 | Soldering and Desoldering (Unit) | Solder and desolder electrical connections using specified procedures and appropriate tools. Evaluate soldered electrical connections using a visual method. | 3.00<br>6.10 |
| 71.01.05.00 | Wire Harness Fabrication (Unit) | Given a layout diagram, construct wire harnesses using appropriate materials, tools, and procedures. | 3.00 |
| 71.01.06.00 | Evaluation and Inspection (Unit) | Inspect and evaluate soldered electrical connections using visual and physical techniques. Operate electronic test equipment according to manufacturer's instructions. Prepare and use an electronic device assembly workstation. | 6.10<br>3.00 |
| 71.02.00.00 | Electronic Assembly (Course) | Assemble various radio circuits, using correct tools when given the components for assembly and the circuit schematic. Perform operational checks of completed radio circuits, following appropriate test procedures and using test equipment. | 3.00<br>6.10 |

ELECTRONIC ASSEMBLY (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 71.02.01.00 | Assembling a Detector (Unit) | Mechanically and electrically assemble fixed and variable types of components for radio signal detector, tuned circuit and vacuum tube signal detectors using schematic diagrams, exploded pictorials, layout diagrams, and appropriate tools. | 3.00 |
| 71.02.02.00 | Assembling a Regenerative Receiver (Unit) | Mechanically and electrically assemble fixed and variable types of components for vacuum tube amplifiers, detector amplifiers, and regenerative detector amplifiers using schematic diagrams, exploded pictorials, layout diagrams, and appropriate tools. | 3.00 |
| 71.02.03.00 | Assembling a Radio Power Supply (Unit) | Mechanically and electrically assemble fixed and variable types of components for transformer coupling circuit and radio power supply circuit using schematic diagrams, exploded pictorials, layout diagrams, and appropriate tools. | 3.00 |
| 71.02.04.00 | Assembling an Audio Amplifier (Unit) | Mechanically and electrically assemble fixed and variable types of components for an audio amplifier and detector circuit using schematic diagrams, exploded pictorials, layout diagrams, and appropriate tools. | 3.00 |
| 71.02.05.00 | Assembling a Radio Frequency Amplifier (Unit) | Mechanically and electrically assemble fixed and variable types of components for a radio frequency amplifier and oscillator circuit using schematic diagrams, exploded pictorials, layout diagrams, and appropriate tools. | 3.00 |
| 71.02.06.00 | Assembling a Superheterodyne Receiver (Unit) | Mechanically and electrically assemble fixed and variable types of components for a superheterodyne receiver, short-wave band receiver, and beat frequency oscillator using given specifications and appropriate tools. | 3.00 |

## CURRICULUM AREA 72: ELECTRICAL WIRING

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 72.01.00.00 | Electrical Wiring Rough-In (Course) | Identify the procedures for sketching layouts, estimating materials, and roughing in electrical wiring. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation, students will sketch layouts, estimate materials required, and make installations of electrical wiring in a rough-in mode. | 1.21<br>5.20<br>3.00 |
| 72.01.01.00 | Outlet & Switch Boxes (Unit) | Identify types and characteristics of electrical outlet, switch, and junction boxes, and the procedure for installing them. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation, students will sketch layouts, estimate materials required and make installations of outlet, switch, and junction boxes. | 1.12<br>5.10<br>5.20<br>3.00 |
| 72.01.02.00 | Wiring (Unit) | Identify procedures for sketching, calculating capacity, and installation of electrical circuits. Identify characteristics of electrical conduit given in plan specifications. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation, students will sketch layouts, estimate materials required, and make installations of wiring as specified for the electrical circuits. | 1.21<br>1.12<br>5.10<br>5.20<br>3.00 |
| 72.01.03.00 | Service Entrance (Unit) | Identify electrical and mechanical requirements and procedures for installation of service entrances. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation, students will sketch layouts, estimate materials required, and make installations of electrical service entrance for a specified structure. | 1.24<br>5.10<br>5.20<br>3.00 |
| 72.01.04.00 | Signal and Low Voltage (Unit) | Identify electrical requirements and procedures for installing low voltage circuits. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation, students will sketch layouts, estimate materials required and make installations of low voltage electrical circuits. | 1.24<br>5.10<br>5.20<br>3.00 |

## ELECTRICAL WIRING (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 72.02.00.00 | Electrical Wiring Trim-Out (Course) | Identify characteristics of symbols, and procedures for electrical trim-out. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation with electrical wiring rough-in, students will list materials required and make installations of electrical wiring in a trim-out mode. | 1.21<br>5.20<br>3.00 |
| 72.02.01.00 | Outlets (Unit) | Identify characteristics of and procedures for installation of electrical outlets. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation with electrical wiring rough-in, students will estimate materials required and install the specified electrical outlets. | 1.21<br>5.20<br>3.00 |
| 72.02.02.00 | Fixtures (Unit) | Identify electrical fixture characteristics, symbol designations, and installation procedures. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation with electrical wiring rough-in, students will estimate materials required and install the specified electrical fixtures. | 1.21<br>5.20<br>3.00 |
| 72.02.03.00 | Switches (Unit) | Identify characteristics of electrical switches and procedures for their installation. Given blueprint specifications, National Electrical Codes, tools, building or shop simulation with electrical wiring rough-in, students will estimate materials required and install the specified electrical switches. | 1.21<br>5.20<br>3.00 |
| 72.02.04.00 | Appliances (Unit) | Identify placement of, characteristics of, and procedures for installing circuits for electrically operated appliances. Given blueprint specifications, National Electrical Codes, tools, building of shop simulation with electrical wiring rough-in, students will estimate materials required and install the specified electrically operated appliances. | 1.21<br>5.20<br>3.00 |
| 72.02.05.00 | Miscellaneous (Unit) | Identify characteristics and functions of electrical circuit control devices used in service entrances. Given blueprint specifications, National Electrical Codes, tools and supplies, building or shop simulation with electrical wiring rough-in, students will estimate materials required and install the specified miscellaneous devices that control electrical energy applied to electrical circuits and devices. | 1.22<br>5.20<br>3.00 |

## CURRICULUM AREA 73: PLUMBING

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 73.01.00.00 | Drainage and Vent Systems (Course) | Plan, prepare, and assemble the rough-in portions of drainage, waste, and vent systems according to given specifications (codes, manufacturer's and customer's) using safe practices and acceptable procedures. | 5.20<br>3.00 |
| 73.01.01.00 | Pipe and Fittings Assembly (Unit) | Prepare and join drainage, waste, and vent assemblies and steel pipe assemblies according to specifications using appropriate tools, equipment and materials. | 5.20<br>3.00 |
| 73.01.02.00 | Planning, Layout, and Assembly (Unit) | Recognize the layout and procedures for installing sewer systems, soil stacks, drains, vents, traps, and cleanouts; and identify the types and functions of components used. Plan layout and assemble vent stack, and house drain according to sketch and specifications following safe practices and procedures. Determine the discharge capacity in gallons per minute of given stacks, fittings, and installations. Identify and explain procedures for locating and removing drain stoppages. | 1.25<br>5.20<br>3.00 |
| 73.02.00.00 | Supply Piping Systems (Course) | Plan, prepare, and assemble the finish portions of plumbing systems according to given specifications (codes, manufacturer's and customer's) using safe practices and acceptable procedures. | 5.20<br>3.00 |
| 73.02.01.00 | Pipe and Fittings (Unit) | Identify procedures for measuring, layout, preparing, and assembling threaded pipe and pipe fittings used in supply piping systems. Identify the type and functions of threaded pipe and pipe fittings. List material requirements, sketch, measure, layout, prepare, and assemble threaded pipe and pipe fittings for supply piping systems according to given sketches and specifications following safe practices and procedures. | 1.25<br>5.10<br>5.20<br>3.00 |
| 73.02.02.00 | Cold Water Supply (Unit) | Identify the assembly procedures for copper pipe, fittings and valves for supply piping. Perform the material determination, layout, preparation, and assembly of copper pipe, fittings, and valves for supply piping according to specifications following safe practices. Identify the effects and characteristics of water and service piping related to plumbing. Determine and calculate water pressures for given situations. | 1.25<br>5.20<br>1.12 |

## PLUMBING (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 73.02.03.00 | Hot Water Supply (Unit) | Recognize the concepts and principles involving heat and its effect on water in plumbing systems. Identify procedures for measuring, laying out, preparing, and assembling flared pipe and fittings used in supply piping systems. Identify the type and functions of copper flared pipe and fittings and compression fittings. Identify the procedure for installing and servicing water heaters and hot water storage tanks. Solve problems determining the quantity of heat. List material requirements, measure, lay out, prepare, and assemble copper pipe and fittings for supply piping systems according to given specifications following safe practices. Install and service water heaters. | 1.31<br>3.00<br>5.20 |
| 73.02.04.00 | Fixtures (Unit) | Measure, lay out, and install plumbing fixtures according to specifications following safe practices and procedures. Install and service traps, faucets, waster, strainer, and overflow as specified. Identify procedures for measuring, laying out, preparing and installing plumbing fixtures. Identify the procedures for installing and servicing traps and sink or vanity accessories. | 3.00<br>1.22 |
| 73.03.00.00 | General Procedures and Practices for Building Trades and Services (Course) | Identify the equipment and recognize the practices that are used to protect personnel in the work environment. Identify hand and measuring tools, their functions, and procedures for their care and use. Determine the tolerance from specifications and recognize how to apply it in measurement. | 1.12<br>1.21<br>3.00 |
| 73.03.01.00 | Safety (Unit) | Identify personal and work environment, equipment, techniques and procedures that insure greatest protection for people. | 1.21 |
| 73.03.02.00 | Hand Tools (Unit) | Identify the hand tools and recognize their functions. Identify the procedures for inspecting, cleaning, and storing hand tools. | 1.12<br>1.25 |
| 73.03.03.00 | Measurement (Unit) | Discriminate between the need for precision and non-precision measuring instruments, select and use the appropriate instrument. Apply the desired tolerance for the given measurement situation and instrument. Identify the measuring instruments and recognize their proper use. | 1.24<br>3.00<br>1.12 |

## CURRICULUM AREA 74: HEATING SYSTEMS

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 74.01.00.00 | Heating Systems and Servicing (Course) | Describe, explain, and demonstrate the operating principles and characteristics of residential heating systems. Identify, troubleshoot, repair, replace, and adjust component parts of heating and heat distribution systems using appropriate tools, equipment, and supplies, following desired safe practices that result in meeting manufacturer's specifications. | 3.00<br>6.10 |
| 74.01.01.00 | Heating Systems (Unit) | 1. Describe, explain, demonstrate, and record the operating principles and characteristics of residential heating systems.<br>2. Draw a wiring diagram on a blank block diagram of the component parts for a typical gas-fired air furnace that is readable and correlates with manufacturer's specifications. Manufacturer's specification sheets are provided. Reference materials may be used.<br>3. Compare operational data of a gas-fired air furnace with the name plate specifications using tools and test equipment and by starting the furnace, taking temperatures, static pressures, and making appropriate calculations. Comparisons are to be completed in less than four (4) hours and temperatures recorded within ±2°, the calculations and static pressure recordings within ±2%. | 5.10<br>3.00<br>5.10<br>6.10 |
| 74.01.02.00 | Gas Heating Systems and Servicing (Unit) | Identify, troubleshoot, repair, replace, and adjust component parts of gas-fired forced-air heating and heat distribution systems using tools and equipment and following safe procedures that meet manufacturer's specifications. Recognize proper installation of gas-fired forced-air furnaces and the heat distribution systems. Service and repair electric and gas-fired water heaters. | 6.10<br>1.25<br>3.00 |
| 74.01.03.00 | Oil Heating Systems and Servicing (Unit) | Identify, troubleshoot, repair, replace, and adjust component parts of oil-fired hydronic heating and heat distribution systems using tools and equipment and following safe procedures that meet the manufacturer's specifications. Recognize proper installation of oil-fired furnaces and the heat distribution systems. | 6.10<br>1.25 |

CURRICULUM AREA 75: REFRIGERATION/COOLING SYSTEMS

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 75.01.00.00 | Refrigeration/Cooling Systems (Course) | Troubleshoot and make operable refrigeration and cooling systems using appropriate tools, equipment, supplies, service manual, and procedures. | 6.10<br>3.00 |
| 75.01.01.00 | Refrigeration Systems (Unit) | Identify the definitions for British Thermal Unit (BTU), saturation temperature, latent, specific, and sensible heat. Explain the operating principles of a simple refrigerator. Identify the major components (evaporator, compressor, and condensor) and their purpose in a simple refrigeration system. Measure and record temperatures and pressures using various types of thermometers and pressure gauges. Calculate the amount of heat energy (in BTU's) needed to do a specified amount of work. | 1.11<br>1.22<br>1.12<br>3.00 |
| 75.01.02.00 | Evacuating, Charging, and Leak Testing Refrigeration Systems (Unit) | Identify the operating characteristics of a compressor. Evacuate, charge, leak test, and repair leaks in a refrigeration system using appropriate tools, equipment, supplies, and procedures, according to manufacturer's specifications. | 1.22<br>3.00 |
| 75.01.03.00 | Fundamentals of Refrigeration and Controls (Unit) | Test refrigerant controls for operational malfunctions and properly correct control malfunctions by cleaning, adjusting, or replacement using appropriate tools, equipment, supplies, and procedures. Identify operational characteristics of a typical refrigeration system and the refrigerant in various parts of the refrigerant circuit. Identify refrigerant controls, their purpose and characteristics. | 6.10<br>3.00<br>1.21 |
| 75.01.04.00 | Domestic Refrigeration and Controls (Unit) | Troubleshoot and repair typical refrigerator and window air conditioner using appropriate tools, equipment, supplies, and procedures. Identify procedures for parts ordering, troubleshooting, and making operational the various domestic refrigeration systems. Identify operational characteristics of various refrigeration systems. Draw schematic wiring diagrams for refrigeration system. Identify the characteristics and purposes of supplies used in refrigeration systems repair. | 6.10<br>3.00<br>1.21 |

## REFRIGERATION/COOLING SYSTEMS (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 75.01.05.00 | Residential/Commercial Refrigeration Systems (Unit) | Troubleshoot, repair, and service residential/commercial central refrigeration systems using appropriate tools, equipment, supplies, and procedures. Identify the characteristics of central refrigeration systems. | 6.10<br>3.00<br>1.22 |
| 75.01.06.00 | Troubleshooting an Air Conditioning Unit with Electrical Malfunctions (Unit) | Draw wiring diagrams for and troubleshoot a central air conditioner that has electrical malfunctions using appropriate tools, test equipment, and procedures. Record the malfunctions found. | 5.10<br>6.10 |

## CURRICULUM AREA 76: APPLIANCE SERVICE

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 76.01.00.00 | Heater-Type Appliances (Course) | Given service information, tools, and materials, you will service, diagnose difficulties, disassemble, repair, and replace components for heater-type appliances. | 6.10<br>3.00 |
| 76.01.01.00 | Irons (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace or service component parts, and reassemble an electric iron when given service manuals and tools. Order replacement parts for appliances using a catalog. | 6.10<br>3.00 |
| 76.01.02.00 | Roasters (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace, or service component parts, and reassemble a roaster when given service manuals and tools. | 6.10<br>3.00 |
| 76.01.03.00 | Space Heaters (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace or service component parts, and reassemble a space heater according to manufacturer's specifications using appropriate service manuals, equipment, and tools and following safe practices. Identify characteristics of operation, components, and diagnostic repair and service procedures for electric space heaters. | 6.10<br>3.00<br>1.22 |
| 76.01.04.00 | Water Heaters (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace, or service component parts, and reassemble a water heater when given service manuals and tools. | 6.10<br>3.00 |
| 76.01.05.00 | Electric Ranges (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace, or service component parts, and reassemble an electric range according to manufacturer's specification using appropriate service manuals, equipment, and tools and following safe practices. Identify characteristics of operation, components, and diagnostic repair and service procedures for electric ranges. | 6.10<br>3.00<br>1.22 |
| 76.01.06.00 | Gas Ranges (Unit) | Operate, disassemble, diagnose malfunctions, repair, replace, or service component parts, and reassemble a gas range according to manufacturer's specifications using appropriate service manuals, equipment and tools, and following safe practices. Identify characteristics of operation, components, and diagnostic repair and service procedures for gas ranges. | 6.10<br>3.00<br>1.22 |

## APPLIANCES SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 76.02.00.00 | Motor-Operated Appliances (Course) | Operate, diagnose malfunctions, repair, and service motor-operated appliances, using appropriate tools, equipment, service manuals, and procedures. | 6.10<br>3.00 |
| 76.02.01.00 | Mixers and Blenders (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, or replace component parts, and reassemble a mixer and a blender using service manuals and tools. Identify characteristics of mixer and blender operation and components. Identify procedure for diagnosis, repair, and service of mixers and blenders. | 6.10<br>3.00<br>1.25 |
| 76.02.02.00 | Vacuum Cleaners and Floor Polishers (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, or replace component parts, and reassemble a vacuum cleaner and a floor polisher using service manuals and tools. Identify vacuum cleaner and floor polisher component parts and characteristics of operation. Identify procedures for diagnosis, repair, and service of vacuum cleaners and floor polishers. | 6.10<br>3.00<br>1.22<br>1.25 |
| 76.02.03.00 | Washing Machines (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, and replace component parts, and reassemble a washing machine, using service manuals and tools. Identify washing machine characteristics of operation and component parts. Identify the procedures for diagnosis, repair, and service of washing machines. | 6.10<br>3.00<br>1.22<br>1.25 |
| 76.02.04.00 | Garbage Disposers (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, and replace component parts, and reassemble a garbage disposer using service manuals and tools. Identify garbage disposer characteristics of operation and component parts. Identify procedures for diagnosis, repair, and service of garbage disposer. | 6.10<br>3.00<br>1.22<br>1.25 |
| 76.02.05.00 | Clothes Dryers (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, and replace component parts, and reassemble a clothes dryer using service manuals and tools. Identify clothes dryer characteristics of operation, and component parts. Identify procedures for diagnosis, repair, and service clothes dryer. | 6.10<br>3.00<br>1.22<br>1.25 |

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 76.02.06.00 | Dishwashers (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, and replace component parts, and reassemble an electric dishwasher using service manuals and tools. Identify dishwasher characteristics of operation and component parts. Identify procedure for diagnosis, repair, and service of dishwashers. | 6.10<br>3.00<br>1.22<br>1.25 |
| 76.02.07.00 | Compactor (Unit) | Operate, disassemble, diagnose malfunctions, repair, service, and replace component parts, and reassemble an electric compactor using service manuals and tools. Identify electric compactor characteristics of operation and component parts. Identify procedures for diagnosis, repair, and service of electric compactors. | 6.10<br>3.00<br>1.22<br>1.25 |

## CURRICULUM AREA 77: RADIO & TV SERVICE

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.01.00.00 | D.C. Circuits (Course) | Given a student handbook, a student unit booklet, equipment, and work station facilities, complete exercises and experiments that enable you to identify and explain characteristics of electricity. Mathematically determine and measure with equipment, current, resistance, power, and voltage and their effect in direct current circuits. | 1.32<br>3.00 |
| 77.01.01.00 | Current (Unit) | Give a student unit booklet, complete exercises about electrical current that enable you to identify and explain the theoretical characteristics of electricity (emphasizing current flow), use mathematics to determine current flow for direct current series circuits and identify the ammeter, its purpose, and method of use. | 1.32<br>3.00 |
| 77.01.02.00 | Voltage (Unit) | Given a student unit booklet, a student handbook, equipment, and an experiment work station, complete exercises and prescribed experiments about measuring potential differences (voltage) that enable you to identify theoretical and practical characteristics of electromotive force (voltage), calculate voltage output for various sources, and identify the voltmeter, its purpose, and method of use. | 1.32<br>3.00 |
| 77.01.03.00 | Resistance (Unit) | Given a student unit booklet, a student handbook, equipment, and an experiment work station, complete exercises and prescribed experiments about resistors and resistance that enable you to identify and explain the theoretical and practical characteristics of resistance and resistors, calculate the resistance of electrical conductors, and identify the ohmmeter, its purpose, and method of use. | 1.32<br>3.00<br>1.21 |
| 77.01.04.00 | Measuring Voltage and Current in Series Circuits (Unit) | Given a student unit booklet, a student handbook, equipment, and an experiment station, complete exercises and prescribed experiments that enable you to identify and explain theoretical and practical characteristics of DC circuits. | 1.32 |
| 77.01.05.00 | Relationships of Current, Voltage, and Resistance (Unit) | Given a student unit booklet, a student handbook, equipment, and an experiment station, complete exercises and prescribed experiments that enable you to identify and explain relationships of voltage, current, resistance, and power, using the power formula and Ohm's Law; calculate electrical power; and use the comparison table and multimeter troubleshooting methods for direct current series circuits. | 1.31<br>3.00<br>1.21 |

## RADIO & TV SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.01.06.00 | Parallel Circuits (Unit) | Given a student unit booklet, complete exercises that identify and explain relationships of current, power, resistance, and voltage. Use the power formula and Kirchkoff's Law to calculate electrical power. Use a troubleshooting table. | 1.31<br>3.00<br>1.21 |
| 77.01.07.00 | Series-Parallel Circuits (Unit) | Given a student unit booklet, complete exercises that identify and explain the relationships of voltage and resistance in complex (series-parallel) direct current circuits; and identify voltage divider, its purpose, and operational characteristics. | 1.31<br>1.21 |
| 77.01.08.00 | Magnetism and Electromagnetics (Unit) | Given a student unit booklet, complete exercises that identify and explain the theoretical and practical characteristics of magnetism and induction in direct current electrical/electronic circuits. | 1.32 |
| 77.01.09.00 | Mutual Induction and RL Circuits (Unit) | Given a student unit booklet, complete exercises that identify, explain, and mathematically determine the effect that inductance, voltage, and resistance have on induction and RL time constant in electrical/electronic current circuits. | 1.31 |
| 77.01.10.00 | Capacitance (Unit) | Given a student unit booklet, a student handbook, equipment, and an experiment station, complete exercises and prescribed experiments that enable you to identify, explain, and mathematically determine the effect that capacity, voltage, and resistance have on capacitance and RC time constant in electrical/electronic direct current circuits. | 1.31 |
| 77.02.00.00 | A.C. Circuits (Course) | Given a student handbook and unit booklets, you will complete workbook exercises about alternating current (AC) circuits that enable you to:<br>1. Use mathematics to describe electronic properties of circuits.<br>2. Identify circuit purpose.<br>3. Explain operational characteristics of circuits. | <br><br>1.31<br>1.21<br>5.10 |
| 77.02.01.00 | Introduction to A.C. (Unit) | Identify an electrical generator, its parts, its function, and explain its operational characteristics. | 1.22 |

## RADIO & TV SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.02.02.00 | A.C. Relationships (Unit) | Explain relationships between current and electromotive force in inductive and capacitive AC circuits. Define and calculate impedance, reactance, and power for AC circuits. | 1.31<br>1.11<br>3.00 |
| 77.02.03.00 | The Transformer (Unit) | Identify a transformer, its application, and explain its characteristics of operation. | 1.22 |
| 77.02.04.00 | Power Supplies (Unit) | Identify electronic power supplies, identify their functions, and explain their operational characteristics. | 1.22<br>5.10 |
| 77.02.05.00 | A.C. Computations (Unit) | Use mathematics to describe the electronic properties of alternating current series circuitry. | 5.10 |
| 77.02.06.00 | Series Resistive-Reactive Circuits (Unit) | Identify electronic properties and explain their relationships for resistive-inductive and resistive-capacitive alternative current series circuits. | 1.12<br>5.10 |
| 77.02.07.00 | Series Resonance (Unit) | Identify and calculate series circuit characteristics at, above, and below resonant frequency. | 3.00 |
| 77.02.08.00 | Parallel Resistive-Reactive Circuits (Unit) | Identify and calculate parallel circuit characteristics at, above, and below resonant frequency. | 3.00 |
| 77.03.00.00 | Basic Radio Theory & Component Assembly (Course) | Given text/workbook, tools, and equipment, student will diagnose difficulties, make necessary adjustments, remove, and replace components for a radio receiver to make it function according to manufacturer's standards. | 6.10<br>3.00 |
| 77.03.01.00 | Introduction to Radio (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, identify basic characteristics of radio signals and broadcast radio signals and install a broadcast receiving antenna. | 1.22<br>3.00 |

## RADIO & TV SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.03.02.00 | Crystal Detectors (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, identify what a radio receiver does and what detector circuits are and how vacuum diodes work. Rectify current and voltage with a crystal diode and build a radio signal detector, a tuned circuit for radio signals, and a vacuum tube signal receiver. | 1.21<br>1.22<br>3.00 |
| 77.03.03.00 | Regenerative Receivers (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, identify what the grid in a vacuum tube does, what things a vacuum tube can do, how feedback is used for extra amplification, and build a vacuum tube amplifier, a detectar-amplifier, and a regenerative detector-amplifier. | 1.21<br>1.22<br>3.00 |
| 77.03.04.00 | Radio Power Supply Section (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, identify what a transformer is, how a receiver power supply operates, show how a transformer reacts to DC and AC, demonstrate voltage step-up and step-down, and test the power supply of an electrolytic capacitor. | 1.21<br>1.22<br>3.00 |
| 77.03.05.00 | Radio Audio Section (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, identify how tubes use operating voltages, what the audio section of a receiver does, and how a detector circuit operates. Also, show how a grid signal is amplified and inverted in the plate circuit of an amplifier, and build a detector circuit. | 1.22<br>3.00 |
| 77.03.06.00 | Radio RF Section (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, explain what the RF section of a receiver does and tell what an oscillator is and how it works. Build a RF amplifier and test an oscillator circuit. | 5.10<br>3.00 |
| 77.03.07.00 | Superheterdyne Receivers (Unit) | Given a basic radio text/workbook and the necessary tools and equipment, explain what a converter circuit is used for, what does receiver alignment mean, and what are short wave signals. Also, build a superheterdyne receiver, align a superheterdyne receiver, and add a short wave band and BFO to a receiver. | 1.21<br>3.00 |
| 77.04.00.00 | Television Repair (Course) | Given service manual, tools, equipment, students will service; diagnose difficulties; make necessary adjustments; remove, repair, and replace parts for television receivers. | 6.10<br>3.00 |

## RADIO & TV SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.04.01.00 | Introduction to/and Block Diagram of Television (Unit) | The student uses an information manual, television set, film loops and a student response manual to acquire knowledge about general function of television receivers by reviewing the functions of each section of the receiver. | 1.12 |
| 77.04.02.00 | Television Audio Section Troubles (Unit) | Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments, remove, repair, and replace components for the audio and intermediate-frequency sound section of the television receiver using the student concept manual, a response manual, tools, equipment, and television diagnosis trainer. | 1.24<br>6.10<br>3.00 |
| 77.04.03.00 | Television Video Section Troubles (Unit) | Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments, remove, repair, and replace components for the video stages that include the picture tube, video detection and amplifiers, intermediate frequency amplifiers and the turner of the television receiver using the student concept manual, a response manual, tools, equipment, and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |
| 77.04.04.00 | Television AGC Troubles (Unit) | 1. Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments; remove, repair and replace components for the automatic gain control (AGC) section of the television receiver using the student concept manual, a response manual, tools, equipment, and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |
| | | 2. The student uses an information manual and oscilloscope to acquire knowledge about the use of the oscilloscope in troubleshooting the television receiver. | 1.12 |
| 77.04.05.00 | Television Sweep Section Troubles (Unit) | Students will recognize symptoms of troubles; diagnose difficulties; make necessary adjustments; remove, repair, and replace components for the synchronization and sweep stages of the television receiver using the student concept manual, a response manual, tools, equipment and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |

## RADIO & TV SERVICE (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 77.04.06.00 | Television High-Voltage and Power Supply Troubles (Unit) | Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments for the low and high-voltage power supply sections of the television receiver using the student concept manual, a response manual, tools, equipment and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |
| 77.04.07.00 | Introduction to Color Television (Unit) | Given a student concept manual, response manual, television diagnostic trainer, students acquire knowledge about color television principles and circuitry and skill in color television receiver set-up adjustments. | 1.12<br>3.00 |
| 77.04.08.00 | Television Color Section Troubles (Unit) | Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments; remove, repair, and replace components for the color sections of the television receiver using the student concept manual, a response manual, tools, equipment, and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |
| 77.04.09.00 | Television Troubleshooting Summary (Unit) | Students will recognize symptoms of trouble; diagnose difficulties; make necessary adjustments; remove, repair, and replace components for the special features of television, like remote control and automatic tuning and any other part of the television receiver, using the student concept manual, a response manual, tools, equipment, and television diagnostic trainer. | 1.24<br>6.10<br>3.00 |

CURRICULUM AREA 78: ELECTRIC MOTOR REPAIR

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 78.01.00.00 | Electric Motor Repair (Course) | Given service information, tools, supplies, and equipment, students will service, diagnose difficulties, disassemble, order, repair, and replace components for selected AC/DC motors and generators. Successful achievement will be indicated by:<br>1. Motors function according to manufacturer's standards.<br>2. Following procedures given on performance checklist.<br>3. 80% accuracy on multiple choice objective tests. | 6.10<br>3.00 |
| 78.01.01.00 | Electric Motor Fundamentals (Unit) | Identify and describe basic operational characteristics of simple and complex motor types and generators, using schematic diagrams. | 5.10 |
| 78.01.02.00 | Rewinding (Unit) | Identify procedures and purposes of taking data, stripping, insulating and winding motor coils. Then, using appropriate tools and equipment, take data strip, insulator, and wind motorstators and generator field coils. | 1.25<br>3.00 |
| 78.01.03.00 | Split-Phase Induction Motors (Unit) | Troubleshoot, repair, and rewind split-phase induction motors using appropriate tools, equipment, and procedures. Identify parts, operational characteristics and procedures for diagnosis and repair of split-phase induction motors. | 6.10<br>3.00<br>1.21 |
| 78.01.04.00 | Capacitor Motors (Unit) | Troubleshoot, repair, and rewind capacitor motors using appropriate tools, equipment, and procedures. Identify parts, operational characteristics and procedures for diagnosis and repair of capacitor motors. | 6.10<br>3.00<br>1.21 |
| 78.01.05.00 | Repulsion Motors (Unit) | Troubleshoot, and repair repulsion motors using appropriate tools, equipment, and procedures. Identify parts, operational characteristics and procedures for troubleshooting and repair of repulsion motors. | 6.10<br>3.00<br>1.21 |
| 78.01.06.00 | Polyphase Motors (Unit) | Given text and illustrations, tools, equipment, and materials describe, identify, disassemble, troubleshoot and repair polyphase motors. | 1.12<br>6.10<br>3.00 |

## ELECTRIC MOTOR REPAIR (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 78.01.07.00 | Direct Current Motors and Generators (Unit) | Given a text and illustrations, tools, equipment, and materials; identify, disassemble, identify connection methods. Troubleshoot, and repair DC motors and DC generators. | 1.12<br>6.10<br>3.00 |
| 78.01.08.00 | Universal and Shaded Pole Motors (Unit) | Given a text and illustrations, tools, equipment, and materials; describe, troubleshoot, service, repair, and reassemble universal and shaded pole motors. | 1.12<br>6.10<br>3.00 |

## CURRICULUM AREA 79: DRAFTING

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 79.01.00.00 | Basic Drawing (Course) | The student will develop skill in Lettering, Geometric Construction, Visualization and Shape Description, Orthographic Projection, Dimensioning, drawing section views, intersections and developments and working drawings. | 3.00 |
| 79.01.01.00 | Mechanical Drawing (Unit) | Apply basic line techniques, measurement, instrument and pencil usage. Identify the types of lines and drafting instruments. | 3.00 |
| 79.01.02.00 | Lettering (Unit) | The objective of this unit is to demonstrate skill in lettering and use of lettering instruments. | 3.00 |
| 79.01.03.00 | Geometric Construction (Unit) | The objective of this unit is to apply the principles of Geometric Construction by making a drawing of an object from a given illustration. Identify the terms, principles and techniques used in Geometric Construction. | 3.00<br>1.12<br>1.21 |
| 79.01.04.00 | Sketching and Shape Description (Unit) | Add missing lines to given orthographic drawings and draw a freehand isometric sketch of the object. Identify correct orthographic views for given isometric drawings, characteristics of appropriate sketching technique terms and definitions for sketching and shape descriptions. | 3.00<br>1.24<br>1.11 |
| 79.01.05.00 | Multiview Projections (Unit) | Draw an orthographic drawing of a given illustration using appropriate tools and procedures. Identify terms, definitions, and characteristics of orthographic drawings. | 3.00<br>1.11 |
| 79.01.06.00 | Dimensioning (Unit) | The objective of this unit is to give the student the opportunity to demonstrate ability to correctly dimension orthographic drawings. | 3.00 |
| 79.01.07.00 | Section Views (Unit) | The student will identify and draw section views containing full and half-sections, revolved and removed parts, and offset features. | 1.21<br>3.00 |
| 79.01.09.00 | Auxiliary Views (Unit) | Draw auxiliary views to supplement regular orthographic projections. Identify auxiliary views for illustrated objects. Identify the characteristics of auxiliary views that supplement regular orthographic projections. | 3.00<br>1.12 |

## DRAFTING (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 79.01.11.00 | Pictorial Drawings (Unit) | Correctly draw pictorial drawings using three different types of projections (isometric, oblique, and perspective). | 3.00 |
| 79.01.13.00 | Intersections and Developments (Unit) | Lay out and construct parallel and radial-line developments given an illustration and dimensions. Identify terms and definitions for and characteristics of parallel and radial-line developments. | 3.00<br>1.11 |
| 79.01.14.00 | Working Drawings (Unit) | Prepare a set of working drawings that would enable a machinist or craftsman to make the object. Identify terms and definitions used with working drawings. Identify purpose and characteristics to various working drawings. | 3.00<br>1.11<br>1.12 |
| 79.02.00.00 | Blueprint Reading (Course) | Given a set of blueprints, the student will interpret and obtain desired information from the prints. | 2.20 |
| 79.02.02.00 | Introduction to Building Trades Blueprint Reading (Unit) | Obtain information about methods and materials used in basic structures, from building trades blueprints. Communicate basic building construction information by sketching. | 2.20<br>3.00 |
| 79.02.03.00 | Blueprint Reading for Carpentry (Unit) | Obtain and interpret information from blueprints for application to carpentry construction. | 2.20 |
| 79.02.04.00 | Blueprint Reading for Plumbing (Unit) | Obtain and interpret information from blueprints for application to plumbing installation. | 2.20 |
| 79.02.05.00 | Blueprint Reading for Sheet Metal (Unit) | Obtain and interpret information from blueprints for application to sheet metal duct systems used in heating and ventilating. | 2.20 |

Each curriculum area has its own job titles. However, some curriculum areas also provide support to individuals preparing for job titles outside the area. For example, Drafting (CA79) provides support training for prospective carpenters, electrical wiremen and plumbers. Table 4.2 contains a list of all job titles in the Building Trades areas and the requirements of each.

Table 4.2

Building Trades Job Title Requirements

| Job Title | Requirements |
|---|---|
| Carpenter | All CA70, (Carpentry), 79.02.02.00, 79.02.03.00 |
| Electronics Assembler | All CA71 (Electronic Assembly) |
| Electrical Wireman | All CA72 (Electrical Wiring), 79.02.02.00, 77.01.01.00 - 77.01.10.00, 77.02.01.00 - 77.02.03.00 |
| Plumber | All CA73 (Plumbing), 79.02.02.00, 79.02.04.00 |
| Heating Systems Servicman | All CA74 (Heating Systems Service), all CA76 (Appliance Repair), 79.02.02.00, 79.02.05.00 |
| Refrigeration/Cooling Systems Serviceman | All CA75 (Refrigeration/Cooling Systems Service), all CA76 (Appliance Service) |
| Appliance Serviceman | All CA76 (Appliance Service), 77.01.01.00 - 77.01.10.00, 77.02.01.00 - 77.02.03.00, 78.01.01.00, 75.01.01.00 - 75.01.03.00 |
| Radio & TV Serviceman | All CA77 (Radio & TV Service) |
| Electric Motor Repairman | All CA78 (Electric Motor Repair), all CA76 (Appliance Service) |
| Draftsman | All CA79 (Drafting) |

Thus, for example, to be certified by Mountain-Plains as an Appliance Serviceman, a student would have to master D.C. circuits, A.C. circuits, some electrical repair, and some aspects of refrigeration and cooling. Only three job titles are completely self-contained, requiring no support (Electronics Assembler, Radio & TV Serviceman and Draftsman).

## COMPLETION CHARACTERISTICS

Completion of a curriculum area, job title, unit or course, is defined as demonstration of mastery of every objective in the component. (The terms "completion" and "validation" are used interchangeably at Mountain-Plains.) A "validator" is one who validates or masters all objectives of a particular instructional component. A job title validator is one who masters every objective of the job title through a combination of performance testing and cognitive examination. Since Mountain-Plains curricula are self-paced, completion rates vary for each individual student depending upon time spent in the program and personal ability.

A total of 94 stabilization population students were enrolled in the Building Trades area.[2] As of the present report two students were still enrolled. All other students had either validated or dropped out. Therefore, all summaries are based on the 92 completed students. Table 4.3 gives the completion rate for each curriculum area. Part a may also be regarded as a summary of job title completion rate.

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[2] All Students entering Mountain-Plains between December 1, 1974 and July 31, 1975 were designated as the program stabilization population. All program components had reached a stable mode by December 1, 1974. No changes were allowed in any program area as long as any of the 367 students were enrolled. This step was taken to facilitate evaluation.

## Table 4.3

### a. Major Area Completion Rate

| CA | Validated N | Validated % | Dropped N | Dropped % | Total |
|---|---|---|---|---|---|
| 70 | 14 | 73.7 | 5 | 26.3 | 19 |
| 72 | 4 | 100.0 | 0 | 0.0 | 4 |
| 73 | 8 | 88.9 | 1 | 11.1 | 9 |
| 74 | 3 | 100.0 | 0 | 0.0 | 3 |
| 75 | 4 | 57.1 | 3 | 42.9 | 7 |
| 77* | 18 | 90.0 | 2 | 10.0 | 20 |
| 78 | 3 | 100.0 | 0 | 0.0 | 3 |
| 79 | 18 | 66.7 | 9 | 33.3 | 27 |
| Total | 72 | 78.3 | 20 | 21.7 | 92 |

*Adjusted; two students still enrolled and classified as neither validated nor dropped.

### b. Support Completion Rate

| CA | Validated N | Validated % | Dropped N | Dropped % | Total |
|---|---|---|---|---|---|
| 75 | 6 | 100.0 | 0 | 0.0 | 6 |
| 76 | 10 | 76.9 | 3 | 23.1 | 13 |
| 77 | 8 | 72.7 | 3 | 27.3 | 11 |
| 78 | 6 | 60.0 | 4 | 40.0 | 10 |
| 79 | 28 | 82.4 | 6 | 17.6 | 34 |
| Total | 58 | 78.4 | 16 | 21.6 | 74 |

A more detailed account of area completion is contained in Table 4.4. Costs per hour were computed for the fiscal year ending August 31, 1975, and are taken directly from the November Management Information Report. These costs include instructor-student contact time as well as equipment, supplies, etc.

Table 4.4

Building Trades Completion Characteristics[3]

CA 70 Carpentry

|  | Enrolled | Mean Budgeted Hrs. | S.D. | Mean Attended Hrs. | S.D. | Cost/Hr. | Cost/Student |
|---|---|---|---|---|---|---|---|
| Y | 14 | 300.3 | 73.0 | 508.8 | 234.5 | $5.63 | $2,864.54 |
| D | 5 | 329.0 | 0.0 | 131.8 | 117.1 | 5.63 | 742.03 |
| T | 19 | 307.8 | 63.4 | 409.6 | 268.1 | 5.63 | 2,306.05 |

Total Cost: $43,815.48

CA 72 Electrical Wiring

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 4 | 515.0 | 124.0 | 424.3 | 148.7 | $1.36 | $ 577.05 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.36 | 0 |
| T | 4 | 515.0 | 124.0 | 424.3 | 148.7 | 1.36 | 577.05 |

Total Cost: $2,308.19

CA 73 Plumbing

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 8 | 574.5 | 1.4 | 411.9 | 84.2 | $6.88 | $2,833.87 |
| D | 1 | 575.0 | 0.0 | 32.5 | 0.0 | 6.88 | 223.60 |
| T | 9 | 574.6 | 1.3 | 369.7 | 149.1 | 6.88 | 2,543.54 |

Total Cost: $22,893.20

CA 74 Heating Systems

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 318.0 | 194.0 | 203.7 | 28.5 | $6.90 | $1,405.53 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 318.0 | 194.0 | 203.7 | 28.5 | 6.90 | 1,405.53 |

Total Cost: $4,216.69

## CA 75 Regrigeration/Cooling

| | Enrolled | Mean Budgeted Hrs. | S.D. | Mean Attended Hrs. | S.D. | Cost/Hr. | Cost/Student |
|---|---|---|---|---|---|---|---|
| Y | 3 | 204.0 | 0.0 | 180.5 | 51.4 | $6.90 | $1,245.45 |
| D | 0 | 204.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 204.0 | 0.0 | 103.1 | 103.1 | 6.90 | 711.39 |

Total Cost: $4,981.80

### CA 75 Support for Heating Systems

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 72.0 | 0.0 | 53.3 | 18.0 | $6.90 | $ 367.77 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 72.0 | 0.0 | 53.3 | 18.0 | 6.90 | 367.77 |

Total Cost: $1,103.31

### CA 75 Support for Electric Motor Repair

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 72.0 | 0.0 | 53.8 | 13.2 | $6.90 | $ 371.22 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 72.0 | 0.0 | 53.8 | 13.2 | 6.90 | 371.22 |

Total Cost: $1,113.66

TOTAL COST FOR CA 75: $7,198.77

## CA 76 Support for Refrigeration/Cooling

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 4 | 151.5 | 0.0 | 233.6 | 82.3 | $6.85 | $1,531.66 |
| D | 3 | 151.5 | 0.0 | 119.7 | 164.9 | 6.85 | 819.95 |
| T | 7 | 151.5 | 0.0 | 179.1 | 124.6 | 6.85 | 1,226.84 |

Total Cost: $8,586.48

### CA 76 Support for Electrical Motor Repair

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 151.5 | 0.0 | 162.8 | 15.9 | $6.85 | $1,115.18 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.85 | 0 |
| T | 3 | 151.5 | 0.0 | 162.8 | 15.9 | 6.85 | 1,115.18 |

Total Cost: $3,345.54

TOTAL COST FOR CA 76: $11,932.02

## CA 77 Radio & TV Repair

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 18 | 907.0 | 0.0 | 727.4 | 162.5 | $1.36 | $ 989.26 |
| D | 2 | 907.0 | 0.0 | 149.0 | 119.0 | 1.36 | 161.84 |
| T | 20 | 907.0 | 0.0 | 669.6 | 283.3 | 1.36 | 910.66 |

Total Cost: $18,211.76

CA 77 Support for Refrigeration/Cooling

| | Enrolled | Mean Budgeted Hrs. | S.D. | Mean Attended Hrs. | S.D. | Cost/Hr. | Cost/Student |
|---|---|---|---|---|---|---|---|
| V | 4 | 248.0 | 0.0 | 153.4 | 34.5 | $1.36 | $ 208.62 |
| D | 3 | 248.0 | 0.0 | 174.0 | 107.4 | 1.36 | 236.64 |
| T | 7 | 248.0 | 0.0 | 162.2 | 67.5 | 1.36 | 220.59 |

Total Cost: $1,544.28

CA 77 Support for Electric Motor Repair

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 248.0 | 0.0 | 246.0 | 127.6 | $1.36 | $ 334.56 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.36 | 0 |
| T | 3 | 248.0 | 0.0 | 246.0 | 127.0 | 1.36 | 334.56 |

Total Cost: $1,003.68

TOTAL COST FOR CA 77: $20,759.72

CA 78 Electric Motor Repair

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 171.0 | 0.0 | 178.3 | 87.0 | $6.90 | $1,230.27 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 171.0 | 0.0 | 178.3 | 87.0 | 6.90 | 1,230.27 |

Total Cost: $3,690.81

CA 78 Support for Heating Systems

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 16.0 | 0.0 | 21.8 | 8.8 | $6.90 | $ 150.42 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.90 | 0 |
| T | 3 | 16.0 | 0.0 | 21.8 | 8.8 | 6.90 | 150.42 |

Total Cost: $451.26

CA 78 Support for Refrigeration/Cooling

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 16.0 | 0.0 | 26.8 | 12.8 | $6.90 | $ 184.92 |
| D | 4 | 16.0 | 0.0 | 16.8 | 20.1 | 6.90 | 115.92 |
| T | 7 | 16.0 | 0.0 | 21.1 | 16.9 | 6.90 | 145.59 |

Total Cost: $1,017.75

TOTAL COST FOR CA 78: $5,159.82

CA 79 Drafting

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 18 | 418.4 | 11.5 | 514.3 | 128.6 | $2.09 | $1,074.89 |
| D | 9 | 422.7 | 0.5 | 184.2 | 138.2 | 2.09 | 384.98 |
| T | 27 | 419.9 | 9.5 | 404.3 | 204.6 | 2.09 | 844.99 |

Total Cost: $22,812.35

CA 79 Support for Carpentry

| | Enrolled | Mean Budgeted Hrs. | S.D. | Mean Attended Hrs. | S.D. | Cost/Hr. | Cost/Student |
|---|---|---|---|---|---|---|---|
| V | 14 | 102.0 | 0.0 | 57.5 | 19.9 | $2.09 | $ 120.18 |
| D | 5 | 102.0 | 0.0 | 42.4 | 10.7 | 2.09 | 88.62 |
| T | 19 | 102.0 | 0.0 | 53.5 | 18.9 | 2.09 | 111.82 |

Total Cost: $2,215.53

CA 79 Support for Electrical Wiring

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 4 | 52.0 | 0.0 | 23.3 | 5.6 | $2.09 | $ 48.70 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.09 | 0 |
| T | 4 | 52.0 | 0.0 | 23.3 | 5.6 | 2.09 | 48.70 |

Total Cost: $194.79

CA 79 Support for Plumbing

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 7 | 125.0 | 0.0 | 74.9 | 40.3 | $2.09 | $ 156.54 |
| D | 1 | 125.0 | 0.0 | 17.0 | 0.0 | 2.09 | 0 |
| T | 8 | 125.0 | 0.0 | 67.7 | 42.5 | 2.09 | 141.49 |

Total Cost: $1,131.74

CA 79 Support for Heating Systems

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | 3 | 112.0 | 0.0 | 47.5 | 7.8 | $2.09 | $ 99.28 |
| D | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.09 | 0 |
| T | 3 | 112.0 | 0.0 | 47.5 | 7.8 | 2.09 | 99.28 |

Total Cost: $297.84

TOTAL COST FOR CA 79: $26,652.25

Total Budgeted Hours for Building Trades: 55,117.0
Total Attended Hours for Building Trades: 46,328.5

TOTAL COST: $154,418.23

---

[3] S.D. = Standard Deviation
V = Validated
D = Dropped
T = Total

The budgeted and attended figures in Table 4.4 are taken from student work plans. The sum of time estimates, which are made for each unit taken, is the budgeted time for the student which is periodically revised depending on the student's rate of progress. Time estimates are kept in order to help the student plan completion activities: for example, interviews, writing resumes, etc. Attended hours are totalled as the student exits the area. Overall, students completed in about 5% of the time budgeted for them to complete. Although variations occurred in some areas, budget estimates may be taken as quite good estimates of time required for the typical student to complete. This figure is attained even though each student is allowed to progress at his or her own best rate.

As can be seen in Table 4.3, completion by area varied from 57.1% for Refrigeration/Cooling Systems Service to 100% for Electrical Wiring, Heating Systems Service, and Electric Motor Repair. However, a chi-square goodness of fit analysis revealed that there were no significant departures from 78.3%, the overall completion rate. Completion rate for support areas was almost identical with 78.4%. Again, no significant departures from this figure were recorded for any of the five curriculum areas providing support training.

Costs by job title may be obtained by adding costs for all direct and support training for a completer in a given job title. Table 4.5 is a summary of these costs.

Table 4.5

Cost by Job Title

| | |
|---|---|
| Carpenter | $2,984.72 |
| Electrical Wireman | 577.05 |
| Plumber | 2,990.41 |
| Heating Systems Serviceman | 5,213.73 |
| Refrigeration/Cooling Systems Serviceman | 3,170.65 |
| Radio & TV Repairman | 789.26 |
| Electric Motor Repairman | 3,051.23 |
| Draftsman | 1,074.89 |

## SOCIODEMOGRAPHIC CHARACTERISTICS

Prior to program entry, information was collected for each of the students in Building Trades in the form of 21 sociodemographic indicators. These indicators may be divided into three categories: educational, employment/income, and quality of life. Educational variables include age, years of education, and quantitative and verbal scores on the Wide Range Achievement Test (WRAT). Employment/income consists of monthly salary, other income (including AFDC, welfare, and unemployment), annual family income, and number of weeks unemployed. Quality of life items include family size, use of food stamps, indebtedness, government housing subsidies, and monthly costs of housing and utilities.

Information pertaining to these and other indicators is gathered by the six state offices in the form of a pre-program structured interview. This information, pertaining to heads of household, spouses, and children, is collected and then forwarded to Mountain-Plains. Due to the fact that the Building Trades curriculum areas have very few spouses or single heads of household enrolled, all references will be to married heads of household unless otherwise specified.

Educational Variables. The typical married head of household was between 25 and 26 years of age, spouses were slightly older (26 to 27 years old), and single heads of household were slightly younger (24 to 25 years old). Although there were some variations among the many job titles, the average student had completed approximately 11 years of formal education. Some students had completed as few as seven years and some as many as thirteen.

Achievement scores indicated a slightly higher level of verbal attainment than educational level would suggest. Median verbal score for married heads of household was 13.1. Median quantitative achievement score was 7.7. There was little variability in verbal achievement, but the range of quantitative achievement (as measured by the WRAT) was from 6.5 to 10.1 years. Plumbing students had the lowest quantitative achievement scores while Electrical Wiring students had the highest.

Employment/Income. Heads of household were unemployed an average of 13.2 weeks during the year prior to program entry (program mean is 15.6 weeks). However, during this period, unemployment ranged from 0 to 52 weeks. Monthly income from the last job held prior to program entry averaged just over $500 (mean = $506.17). An analysis of variance revealed major differences in mean monthly income (F = 402.55, $p < .001$). Students in Drafting had extremely low pre-center monthly incomes (mean = $376.14), while students enrolled in Carpentry and Radio & TV reported rather high pre-center monthly salaries (mean for Carpentry = $540.28; mean for Radio & TV = $542.68). However, mean annual incomes were more evenly distributed. Mean annual salary was $3,765.44, approximating the program mean of $3,530.30. In nearly every respect, Building Trades student families may be regarded as typical of Mountain-Plains families in general. Welfare and unemployment were very near program norms (6% of Building Trades students received welfare, and 27% had received unemployment benefits). Only 14% of these families received AFDC payments as opposed to 22% overall; however, this difference may be attributed to the relatively small number of single heads of household in the area.

Quality of Life. Students in the Building Trades areas were also fairly typical of program families in terms of life quality. Mean family size was 3.2 persons. Debt levels were about $200 higher than program mean ($902.31 for Building Trades as opposed to $705.40 for all students). Approximately 35% of student families in Building Trades purchased food stamps and only about 1% received government housing subsidies.

Roughly one-fourth (22%) paid no rent or other housing payment, and over one-third (35%) paid no utilities (both approximating program norms). Monthly housing payments for all Building Trades students averaged $62.24 (program mean = $61.43). Utilities averaged $27.10 per month (as opposed to $21.32 per month for all program students).

Summary. Building Trades student families may be regarded as fairly typical Mountain-Plains students in terms of pre-center sociodemographic characteristics. They are perhaps slightly younger and have slightly more debts. Income, housing arrangements, involvement in anti-poverty programs, and life styles, are very similar to the remaining 204 stabilization population families.

# Appendix A
# Bloom's Taxonomy of Behavioral Objectives[1]
## (Cognitive Domain)

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### Knowledge

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1.00 Knowledge. Recall of information.

1.10 Knowledge of specifics. Emphasis is on symbols with concrete referents.
    1.11 Knowledge of terminology.
    1.12 Knowledge of specific facts.

1.20 Knowledge of ways and means of dealing with specifics. Includes methods of inquiry, chronological sequences, standards of judgment, patterns of organization within a field.
    1.21 Knowledge of conventions: accepted usage, correct style, etc.
    1.22 Knowledge of trends and sequences.
    1.23 Knowledge of classifications and categories.
    1.24 Knowledge of criteria.
    1.25 Knowledge of methodology for investigating particular problems.

1.30 Knowledge of the universals and abstractions in a field. Patterns and schemes by which phenomena and ideas are organized.
    1.31 Knowledge of principles and generalizations.
    1.32 Knowledge of theories and structures (as a connected body of principles, generalizations, and interrelations).

---

### Intellectual Skills and Abilities

---

2.00 Comprehension. Understanding of material being communicated, without necessarily relating it to other material.
    2.10 Translation. From one set of symbols to another.
    2.20 Interpretation. Summarization or explanation of a communication.
    2.30 Extrapolation. Extension of trends beyond the given data.

3.00 Application. The use of abstractions in particular, concrete situations.

---

[1] Adapted from D.L. Krathwohl, stating objectives appropriately for program, for curriculum, and for instructional materials development. Journal of Teacher Education, 1965, 16, 83-92; also appearing in D.E. Payne (Ed.) Curriculum Evaluation. Lexington, Mass.: D.C. Heath & Co., 1974, under the title "Stating Appropriate Educational Objectives," pp. 69-80.

4.00 Analysis. Breaking a communication into its parts so that origanization of ideas is clear.
    4.10 Analysis of elements. That is, recognizing assumptions.
    4.20 Analysis of relationships. Content or mechanical factors.
    4.30 Analysis of organizational principles. What holds the communication together?

5.00 Synthesis. Putting elements into a whole.
    5.10 Production of a unique communication.
    5.20 Production of a plan for operations.
    5.30 Derivation of a set of abstract relations.

6.00 Evaluation. Judging the value of material for a given purpose.
    6.10 Judgment in terms of internal evidence; e.g., logical consistency.
    6.20 Judgments in terms of external evidence; e.g., consistency with facts developed elsewhere.

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN-PLAINS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER V - MOBILITY & TRANSPORTATION

JULY 1976

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC

# SUMMATIVE INTERNAL EVALUATION
# OF MOUNTAIN-PLAINS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER V - MOBILITY & TRANSPORTATION

Author:

Michael B. Bunch

July 1976

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Research Services Division

David A. Coyle, Director
David L. Irving, Editor

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# INTRODUCTION TO INSTRUCTIONAL/CURRICULUM EVALUATION REPORT SERIES

Instructional/Curriculum Evaluation constitutes one aspect of the evaluative process of Mountain-Plains. Reports in this series, together with reports from External and Affective evaluation series, will provide a thorough documentation of the processes and products of Mountain-Plains. Major subdivisions of the series include:

1. User Trial Reports
2. Descriptive Characteristics
3. Summative Analysis
4. Reliability and Validity Studies
5. Student Evaluation of Staff and Curriculum

Individual reports in each series are currently available from, or are in the process of being incorporated into, the ERIC retrieval system. By the conclusion of the NIE research cycle, Instructional/Curriculum Evaluation Reports will number about 40 or 50. Many reports span two or more areas. These include overall internal evaluation reports and reports on the effects of affective variables on cognitive performance.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program research, and requires some indulgence on the part of the reader.

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# CHAPTER V
# MOBILITY & TRANSPORTATION

Mobility & Transportation is composed of three curriculum areas, Welding Support (CA 36), Automotive (CA 37), and Small Engines (CA 38). These three areas consist of 20 courses, 104 units, and 405 learning activity packages (LAPs). The purpose of this report is to describe the Mobility & Transportation component of Mountain-Plains in terms of objectives, completion characteristics and sociodemographic characteristics of area students.

## OBJECTIVES

Objectives for each LAP, unit, and course are stated in such a way that assessment of mastery may be through cognitive or performance tests or both. These objectives, even at the unit level, are stated in Table 5.1. Each objective is classified as to level of activity required.

Curriculum area 36 (Welding) is strictly a support area; that is, no one at Mountain-Plains receives job training as a welder per se. Curriculum area 38 (Small Engines) has only one job title, Small Engine Mechanic. Automotive (CA 37), however, contains eight job titles, which include Engines & Transmission Repairman, Tune Up & Engine Repairman, Light Duty Mechanic, Tune Up & Auto Air Conditioning Repairman, General Mechanic, Transmission Mechanic, Brake & Front-End Mechanic and Engine Rebuilder. The most extensive job title, and the one chosen by most students, is General Mechanic. These job titles are described in Table 5.2 in terms of course and unit requirements. All units of courses 37.01.00.00, 37.02.00.00, and 37.13.00.00 are taken by all Automotive students; therefore these units are omitted from Table 5.2.

## Table 5.1
## Mobility & Transportation Objectives

### CURRICULUM AREA 36 WELDING

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLO CO |
|---|---|---|---|
| 36.01.00.00 | Gas Welding (Course) | Use oxygen-acetylene welding equipment safely to make the various types of welds in the proper welding positions and to use the flame cutting technique. | 3. |
| 36.01.01.00 | Safety (Unit) | Identify safety equipment and procedures for welding. | 1. |
| 36.01.02.00 | Bottle and Regulator Construction and Operation (Unit) | Recognize and follow proper procedures for sale and effective operation of oxygen-acetylene welding equipment. | 1.<br>3. |
| 36.01.03.00 | Oxygen-Acetylene Cutting (Unit) | Recognize and perform safe, effective metal-cutting with the oxygen-acetylene equipment. | 3. |
| 36.01.04.00 | Oxygen-Acetylene Welding (Unit) | Recognize and perform safe, effective welding of various metals and positions. | 3. |
| 36.02.00.00 | Arc Welding (Course) | Recognize arc welding safety precautions. Use arc welding equipment properly. | 1.<br>3. |
| 36.02.01.00 | Fundamentals of Arc Welding (Unit) | Recognize and select proper welding equipment, material and procedure for various welding applications. | 1.<br>3. |
| 36.02.02.00 | Pad Weld (Unit) | Build up a pad by using the arc welder and the three different motions. | 3. |
| 36.02.03.00 | Butt Weld (Unit) | Butt weld using three different thicknesses of metal. 3/8"-¼". | 3. |
| 36.02.04.00 | Fillet Weld (Unit) | Prepare various fillet welds, using 3/8" iron. | 3. |
| 36.02.05.00 | Lap Weld (Unit) | Demonstrate lap welds using 3/8" metal, performing both overhead and vertical welds. | 3. |

---

[1] Code numbers from Bloom's taxonomy: Level 1 is Knowledge, Level 2 is Comprehension, 3 is Application, 4 is Analysis, 5 is Synthesis, and Level 6 is Evaluation. For more specific description, see Appendix A.

## CURRICULUM AREA 37 AUTOMOTIVE

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 37.01.00.00 | Automotive Shop Safety (Course) | Recognize safety procedures. Identify safety equipment. | 1.1 |
| 37.01.01.00 | Shop Safety (Unit) | Use safety equipment and procedures properly. | 3.0 |
| 37.02.00.00 | Tools and Equipment (Course) | Recognize proper care and use of the tools and equipment encountered by a mechanic on the job. | 1.1 |
| 37.02.01.00 | Basic Tools (Unit) | Recognize the basic hand tools and their proper care and use. | 1.1 |
| 37.02.02.00 | Special Tools (Unit) | Recognize the special tools used in automotive. Demonstrate the proper use of special tools. | 1.1<br>3.0 |
| 37.02.03.00 | Shop Equipment (Unit) | Identify shop equipment. Demonstrate the proper use of shop equipment. | 1.1<br>3.0 |
| 37.03.00.00 | Brake Systems (Course) | Repair brake systems in accordance with manufacturer's specifications. | 3.0 |
| 37.03.01.00 | Fundamentals of Brake Systems (Unit) | Recognize the components and the operation of the brake system. Perform the brake inspection. | 1.1<br>6.2 |
| 37.03.02.00 | Master Cylinder (Unit) | Recognize the components and operation of the master cylinder. Perform an overhaul of the master cylinder. | 1.2<br>3.0 |
| 37.03.03.00 | Drum Brakes (Unit) | Recognize the components and operation of drum brakes. Repair and adjust drum brakes. Overhaul wheel cylinders. | 1.2<br>3.0 |
| 37.03.04.00 | Disc Brakes (Unit) | Recognize the components and operation of disc brakes. Perform caliper overhaul, pad replacement and rotor turning. | 1.2<br>3.0 |
| 37.03.05.00 | Brake Fluids and Lines (Unit) | Recognize the components and operation of brake lines, switches and equalizers. Describe precautions and limitations of brake fluid uses. Perform bleeding of a brake system. | 1.2<br>1.2<br>3.0 |

## AUTOMOTIVE (continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOO COD |
|---|---|---|---|
| 37.03.06.00 | Power Brakes (Unit) | Recognize the components and operation of power brakes. Perform the repair and adjustment of power brakes. | 1.<br>3. |
| 37.03.07.00 | Emergency Brakes (Unit) | Recognize the components and operation of emergency brakes. Perform the adjustment of emergency brakes. | 1.<br>3. |
| 37.04.00.00 | Suspension Systems (Course) | Recognize the theory and analysis of suspension systems. Maintain repair suspension systems. | 1.<br>3.0 |
| 37.04.01.00 | Fundamentals of Suspension (Unit) | Recognize the components and proper operation of front-end suspension. | 1.2 |
| 37.04.02.00 | Tire Balancing (Unit) | Correctly identify the operation of tire balancing. Balance tires and replace and repack wheel bearings. | 1.2<br>3.0 |
| 37.04.03.00 | Front-End Repair (Unit) | Recognize the correct procedure for replacement of front-end components. Replace front-end components. | 1.2<br>3.0 |
| 37.04.04.00 | Front-End Alignment (Unit) | Recognize the components and use proper procedure for front-end alignment. | 1.2 |
| 37.04.05.00 | Steering Gears (Unit) | Recognize the components and proper operation of steering gears. Adjust and overhaul steering gears. | 1.2<br>3.0 |
| 37.04.06.00 | Power Steering (Unit) | Recognize the components and proper operation of power steering. Use the proper procedure for overhaul of power steering components. | 1.2<br>3.0 |
| 37.05.00.00 | Electrical Systems (Course) | Recognize the theory and analysis of electrical systems; perform tests, repairs and adjustments. | 1.3<br>3.0 |
| 37.05.01.00 | Fundamentals of Electrical Systems (Unit) | Recognize the elements and theory of operation of electricity. | 1.3 |
| 37.05.02.00 | Battery Servicing (Unit) | Recognize the components and the operation of the storage battery. Test and service automotive storage batteries. | 1.2<br>6.2<br>3.0 |

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOO COD |
|---|---|---|---|
| 37.05.03.00 | Starting System (Unit) | Identify the components and operation of the starting system. Overhaul starting system components. | 1.2 |
| 37.05.04.00 | Charging Systems (Unit) | Recognize the components and proper operation of the charging system. Test and overhaul the charging system and components. | 1.2<br>6.2<br>3.0 |
| 37.05.05.00 | Ignition Systems (Unit) | Recognize the components of the ignition system. | 1.1 |
| 37.05.06.00 | Lighting Systems (Unit) | Recognize the components and the proper operation of the lighting system. Use correct procedures for diagnoses and repairs of the lighting systems. | 1.2<br>3.0 |
| 37.06.00.00 | Automotive Fuel Systems (Course) | Diagnose and repair automotive fuel systems, components and parts. | 6.2<br>3.0 |
| 37.06.01.00 | Fundamentals of Fuel Systems (Unit) | Recognize the components of the fuel system. Use the proper procedure for fuel system inspection. | 1.1<br>3.0 |
| 37.06.02.00 | Fuel Pumps (Unit) | Recognize the components of the fuel pump. Remove, test and replace the fuel pump. | 1.1<br>3.0 |
| 37.06.03.00 | Fuel Lines and Filters (Unit) | Recognize the components and proper operation of fuel filters. Use proper procedure for fuel line and filter inspection and replacement. | 1.22<br>3.00 |
| 37.06.04.00 | Carburetors (Unit) | Diagnose and repair carburetors. | 6.20<br>3.00 |
| 37.06.05.00 | Fuel Characteristics (Unit) | Recognize the elements and limitations of fuel. | 1.12 |
| 37.06.06.00 | Automatic Chokes (Unit) | Identify the components and operation of chokes. Overhaul and adjust chokes. | 1.22 |
| 37.07.00.00 | Emission Systems (Course) | Recognize the theory and components of automotive emission control systems, perform tests and servicing in accordance with manufacturer's specifications. | 1.32<br>3.00 |

## AUTOMOTIVE (continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 37.07.01.00 | Fundamentals of Emission Systems (Unit) | Recognize the proper operation of emission control systems. | 1.22 |
| 37.07.02.00 | Servicing Emission Systems (Unit) | Use the proper procedures for emission control system testing and servicing. | 3.00 |
| 37.08.00.00 | Tune-Up (Course) | Recognize the theory and procedures of a complete automotive tune-up. Perform complete tune-ups in accordance with the manufacturer's specifications. | 1.32<br>3.00 |
| 37.08.01.00 | Fundamentals of Tune-Up (Unit) | Recognize the tests and the correct procedures for an engine tune-up. | 1.22 |
| 37.08.02.00 | Test Engine Condition (Unit) | Conduct engine tests for power balance, cranking volume and cylinder leakage. | 6.20 |
| 37.08.03.00 | Distributor Repair (Unit) | Recognize the correct procedure for testing, removing, replacing and adjusting of distributor and components. | 1.22 |
| 37.08.04.00 | Adjustments and Repairs (Unit) | Test, adjust and repair ignition system components. | 3.00 |
| 37.08.05.00 | Testing Engine Operation (Unit) | Recognize the correct procedure for testing of engine operation. | 1.22 |
| 37.09.00.00 | Engine Repair (Course) | Recognize the theory and construction of the automotive engine and following correct procedures, repair automotive engine. | 1.32<br>3.00 |
| 37.09.01.00 | Fundamentals of 4-Cycle Engines (Unit) | Identify the components and proper operation of the four-cycle engine. | 1.11<br>1.22 |
| 37.09.02.00 | Engine Construction (Unit) | Identify engine components and the proper operation of the engine. | 1.11<br>1.22 |
| 37.09.03.00 | Valve Train (Unit) | Identify the components of the cylinder head. Perform proper cylinder head inspection and overhaul. | 1.11<br>3.00 |

## AUTOMOTIVE (continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 37.09.04.00 | Engine Block (Unit) | Using proper procedures, overhaul engine block. | 3.00 |
| 37.09.05.00 | Lubricating Systems (Unit) | Identify the components and the proper operation of the oil pump. Following correct procedure, test and replace the oil pump. | 1.22<br>3.00 |
| 37.09.06.00 | Cooling Systems (Unit) | Identify the components and proper operation of the cooling system. Following correct procedure, test and repair cooling system components. | 1.22<br>3.00 |
| 37.10.00.00 | Transmission (Course) | Recognize the theory and procedure of diagnosis. Perform tests and repairs on transmissions, drivelines and differentials. | 1.32<br>3.00 |
| 37.10.01.00 | Clutches (Unit) | Identify the components and proper operation of the clutch. Perform clutch adjustment and component replacement. | 1.22<br>3.00 |
| 37.10.02.00 | Fundamentals of Standard Transmission (Unit) | Identify the components and proper operations of standard transmissions. | 1.22 |
| 37.10.03.00 | Standard Transmission (Unit) | Use the proper procedure for troubleshooting and overhaul of the standard transmission. | 3.00 |
| 37.10.04.00 | Fundamentals of Automatic Transmission (Unit) | Recognize the components and operation of automatic transmissions. | 1.22 |
| 37.10.05.00 | Two-Speed Automatic (Unit) | Use the proper procedures to diagnose and overhaul two-speed automatic transmissions. | 3.00 |
| 37.10.06.00 | Three-Speed Automatic (Unit) | Diagnose and overhaul of three-speed automatic transmissions. | 6.20<br>3.00 |
| 37.10.07.00 | Drive Shafts (Unit) | Recognize the components and the proper operation of drive shafts. Use the proper procedures to diagnose and replace universal joints and drive shafts. | 1.22<br>3.00 |

## AUTOMOTIVE (continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 37.10.08.00 | Differentials (Unit) | Recognize the components and the proper operation of differentials.<br>Use the proper procedures for diagnosis and repair of differentials. | 1.22<br>3.00 |
| 37.11.00.00 | Auto Air Conditioning (Course) | Recognize the theory and components of autmotive air conditioning systems; perform tests and service on automotive air conditioning systems. | 1.32<br>3.00 |
| 37.11.01.00 | Safety (Unit) | Recognize in writing the safety precautions used when working on automotive air-conditioning systems. | 1.12 |
| 37.11.02.00 | Theory of Operation (Unit) | Recognize the components and the proper operation of refrigeration systems, and refrigerants. | 1.22 |
| 37.11.03.00 | Compressors (Unit) | Recognize the components and the proper operations of the refrigeration compressors. | 1.22 |
| 37.11.04.00 | Evaporators (Unit) | Recognize the operation and correct service procedures for the evaporator and the evaporator pressure regulator. | 1.22 |
| 37.11.05.00 | Controls and Accessories (Unit) | Recognize the correct procedures for servicing the automatic temperature control, vacuum controls, and electrical wiring of the automotive air conditioning system. | 1.22 |
| 37.11.06.00 | Diagnosis Procedures (Unit) | Recognize the correct procedures for testing and diagnosing automotive air conditioning system. Test and diagnose an automotive air conditioning system. | 1.22<br>3.00 |
| 37.11.07.00 | Servicing (Unit) | Recognize the correct procedures for when servicing an automotive air conditioning system. | 1.22<br>3.00 |
| 37.12.00.00 | Parts and Accessories (Course) | Recognize the proper use of parts and reference manuals; demonstrate the proper care, use, and cleaning off parts and work areas. | 1.22<br>3.00 |

AUTOMOTIVE (continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 37.12.01.00 | Reference Manuals (Unit) | Recognize the procedures for the correct usage of the reference manuals. | 1.21 |
| 37.12.02.00 | Parts Manual (Unit) | Identify the proper procedures for using parts manuals. | 1.21 |
| 37.12.03.00 | Cleaning Parts and Work Area (Unit) | Identify the components and uses of gaskets, sealants, seals, tubing, hose, wire, wiring, and work orders. | 1.11<br>1.12 |
| 37.13.00.00 | Detailing and Servicing (Course) | Recognize the techniques of automotive detailing and servicing; perform detailing and service procedures. | 1.22<br>3.00 |
| 37.13.01.00 | Oil Changing (Unit) | Use the proper procedures for changing oil and oil filters. | 3.00 |
| 37.13.02.00 | Lubrication (Unit) | Use the correct procedure for lubricating the automobile chassis. | 3.00 |
| 37.13.03.00 | Tires (Unit) | Use the correct procedure to change, rotate, and repair tires. | 3.00 |
| 37.13.04.00 | Minor Body Adjustments (Unit) | Use the correct procedure to adjust doors, hoods, and trunk lids. | 3.00 |

## CURRICULUM AREA 38: SMALL ENGINES

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 38.01.00.00 | Basic Small Engines (Course) | The student will demonstrate skill in maintenance, service, repair, and overhaul of small engines. | 3.00 |
| 38.01.01.00 | Shop Improvement and Safety (Unit) | Identify procedures and practices that demonstrate desirable safety and organization in the shop. | 1.21 |
| 38.01.02.00 | Shop Manuals and Parts Books (Unit) | Use Parts Books, Service Manuals and Flat Rate Manuals. | 3.00 |
| 38.01.03.00 | Work Orders (Unit) | Given a standard work order form, accurately complete it. | 3.00 |
| 38.01.04.00 | Measuring Tools (Unit) | Identify and demonstrate the use and care of several types of measuring instruments. | 1.11 |
| 38.01.05.00 | Engine Design and Terminology (Unit) | Identify engine types by design; define words used in the mechanical trades. | 1.11 |
| 38.01.06.00 | 4-Cycle Theory (Unit) | Identify engine parts. Identify the function of engine parts. Identify how a four-cycle engine operates. Disassemble and reassemble a four-cycle engine. | 1.11<br>1.22 |
| 38.01.07.00 | 2-Cycle Theory (Unit) | Identify the engine parts of a 2-cycle engine, and describe the operation of a 2-cycle engine. | 1.11<br>2.10 |
| 38.01.08.00 | Basic Electricity (Unit) | Explain how the basic electrical theory works; define the terminology associated with electricity. | 2.10<br>1.11 |
| 38.01.09.00 | Ignition Systems (Unit) | Identify three different types of ignition systems and explain how each works. | 1.21<br>2.10 |
| 38.01.10.00 | Electrical Testing (Unit) | Identify the uses of the Graham and Merc-O-Tronic testers. Complete electrical tests on ignition coils and condensers using the Graham and Merc-O-Tronic testers. | 1.21<br>3.00 |

## SMALL ENGINES (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 38.01.11.00 | Lubrication Systems (Unit) | Identify different lubricating systems, identify parts of each system, and explain function of each part. | 1.21<br>2.10 |
| 38.01.12.00 | Fuel System (Unit) | Identify types of fuel systems and engine governors, their component parts and function. | 1.21 |
| 38.01.13.00 | Cooling Systems (Unit) | Identify types of cooling systems. Explain how each system operates. Identify component parts of each system. | 1.21<br>2.10<br>1.11 |
| 38.01.14.00 | Special Tools (Unit) | Identify basic special tools, their function and operation. | 1.11<br>1.21 |
| 38.01.15.00 | Troubleshooting (Unit) | A small engine problem by using a troubleshooting procedure. | 3.00 |
| 38.01.16.00 | Engine Overhaul (Unit) | Identify the proper procedure for overhauling an engine. Disassemble, repair, reassemble and run an engine. | 1.22<br>3.00 |
| 38.01.17.00 | Maintenance (Unit) | Identify the importance of and perform maintenance procedure according to manufacturer's specifications. | 1.24<br>3.00 |
| 38.01.18.00 | Care in Off Season or Storage (Unit) | Identify why off season care and storage are important; prepare an engine for storage and return an engine to service after storage. | 1.24<br>3.00 |
| 38.01.19.00 | Power Transfer (Unit) | Explain the power flow as it travels through the transmission in each gear. Identify the different types of transmissions and clutches. | 2.10<br>1.12 |
| 38.01.20.00 | Lawn Mower Service (Unit) | Perform lawn mower service to manufacturer's specifications. | 3.00 |
| 38.01.21.00 | Rotary Engine Theory (Unit) | Explain the operation of the rotary engine; identify rotary engine component parts; and define terminology related to the rotary engine. | 2.10<br>1.11 |

## SMALL ENGINES (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 38.02.00.00 | Chainsaw (Course) | Troubleshoot, perform repair and maintenance of chains, bar and associated components and perform tune-up on chainsaws. | 6.20<br>3.00 |
| 38.02.01.00 | Terminology (Unit) | Identify terms and their definitions common to the chainsaw industry and identify the parts of a chainsaw. | 1.11 |
| 38.02.02.00 | Chain Care and Maintenance (Unit) | Identify the parts of the chainsaw chain and perform tasks related to the care and maintenance of the chainsaw and related components. | 1.11<br>3.00 |
| 38.02.03.00 | Chain Repair (Unit) | Identify methods of chain removal and repair a chainsaw chain following manufacturer's specifications. | 1.22<br>3.00 |
| 38.02.04.00 | Bar Repair (Unit) | Repair and maintain a chainsaw bar. | 3.00 |
| 38.02.05.00 | Troubleshooting (Unit) | Diagnose and repair chainsaw problems. | 3.00 |
| 38.03.00.00 | Snowmobile (Course) | Service, troubleshoot, repair and overhaul snowmobiles. | 3.00 |
| 38.03.01.00 | Terminology (Unit) | Identify terms and their meanings that are related to snowmobile industry. Identify the parts of a snowmobile. | 1.11 |
| 38.03.02.00 | Chassis, Brakes and Steering (Unit) | Identify, maintain and repair chassis, brake and steering on snowmobile. | 3.00 |
| 38.03.03.00 | Tracks (Unit) | Identify different tracks used on snowmobiles and methods of repair for each. | 1.12<br>1.22 |
| 38.03.04.00 | Suspension (Unit) | Identify and adjust the two types of suspensions used on snowmobiles. Recognize the importance of suspension maintenance. | 1.22<br>3.00 |
| 38.03.05.00 | Troubleshooting (Unit) | Identify and correct problems related to the snowmobile. | 3.00 |

## SMALL ENGINES (Continued)

| M-P FILE CODE | TITLE (Level) | OBJECTIVE | BLOOM CODE |
|---|---|---|---|
| 38.04.00.00 | Motorcycles (Course) | Maintain, service, repair and overhaul motorcycles. | 3.00 |
| 38.04.01.00 | Terminology (Unit) | Identify and define terminology related to the motorcycle. Identify parts of the motorcycle. | 1.11 |
| 38.04.02.00 | Controls (Unit) | To identify all motorcycle controls and perform adjustments according to manufacturer's specifications. | 1.11<br>3.00 |
| 38.04.03.00 | Tire and Wheel Repair (Unit) | Repair motorcycle tires and wheels according to manufacturer's specifications. | 3.00 |
| 38.04.04.00 | Brakes (Unit) | Identify types of motorcycle brake systems. Adjust and repair motorcycle brakes. | 1.12<br>3.00 |
| 38.04.05.00 | Troubleshooting (Unit) | Troubleshoot motorcycle problems; locate problems and repair systems to manufacturer's specifications. | 6.20<br>3.00 |
| 38.05.00.00 | Outboard Engines (Course) | Maintain, service, repair and overhaul outboard marine engines. | 3.00 |
| 38.05.01.00 | Terminology (Unit) | Identify terms and parts related to outboard engines. | 1.11 |
| 38.05.02.00 | Lower Units (Unit) | Identify all parts of the lower unit and the function of each part. | 1.11 |
| 38.05.03.00 | Gearcase (Unit) | Identify the parts and part function of all parts related to the gearcase assembly. Repair components. | 1.11<br>1.22<br>3.00 |
| 38.05.04.00 | Propeller Service (Unit) | Identify the characteristics of outboard marine propellers and problems that occur with them. | 1.12 |
| 38.05.05.00 | Troubleshooting (Unit) | Identify and repair outboard operational problems using a troubleshooting procedure. | 3.00 |

The job titles described in Table 5.2 obviously require varying lengths of time for the average student to complete. Although no student is locked into a fixed time frame, time estimates are made at the outset of each student's training for scheduling purposes and periodic progress checks. Actual amounts of time spent in each area are also recorded.

COMPLETION CHARACTERISTICS

A total of 58 students enrolled in Mobility & Transportation, 46 in an Automotive job title and 12 in Small Engine Mechanic. Forty-eight students required Welding Support. Nearly all students were married heads of households; three single heads of household enrolled in Automotive, and one spouse enrolled in Small Engines. Table 5.3 summarizes the completion characteristics of Mobility & Transportation.

For the purpose of computing completion averages, the seven individuals classified as I (incomplete) under the job title General Mechanic will not be considered. All subsequent completion and cost estimates are based on the adjusted enrollment number of 51 unless otherwise specified. Small Engine Mechanic had the highest completion rate with 83.3% (10 out of 12 classified as V or validated). Brake & Front End Mechanic was next with 66.7% (2 out of 3), followed by Tune Up & Engine Repairman with 50% (4 out of 8). General Mechanic, the job title with the most students, had a completion rate of 47.8% (11 out of 23 enrolled). Three remaining job titles had completion rates of 0% (all students classified as D or dropped): Transmission Mechanic (0 out of 3), Engine Rebuilder (0 out of 1), and Light Duty Mechanic (0 out of 1). The overall completion rate for all Automotive job titles was 43.6% (17 out of 39). Completion for Automotive and Small Engines combined was 52.9% (27 out of 51). This is nearly 20% below the overall program completion rate (excluding Mobility & Transportation) of 72.1%.

## Table 5.2

## Mobility & Transportation Job Title Requirements

### Engine & Transmission Repairman

37.05.01.00
37.05.02.00
37.08.01.00
37.08.02.00
37.09.01.00
37.09.02.00
37.09.03.00
37.09.04.00
37.09.05.00
37.09.06.00
37.10.01.00
37.10.02.00
37.10.03.00
37.10.04.00
37.10.05.00
37.10.06.00
37.10.07.00
37.10.08.00
37.12.01.00
37.12.02.00
37.12.03.00

### Tune Up & Engine Repairman

37.05.01.00
37.05.02.00
37.05.03.00
37.05.04.00
37.05.05.00
37.05.06.00
37.06.01.00
37.06.02.00
37.06.03.00
37.06.04.00
37.06.05.00
37.06.06.00
37.07.01.00
37.07.02.00
37.08.01.00
37.08.02.00
37.08.03.00
37.08.04.00
37.08.05.00
37.09.01.00
37.09.02.00
37.09.03.00
37.09.04.00
37.09.05.00
37.09.06.00
37.12.01.00
37.12.02.00
37.12.03.00

### Light Duty Mechanic

37.03.01.00
37.03.02.00
37.03.05.00
37.03.07.00
37.04.01.00
37.04.02.00
37.05.01.00
37.05.02.00
37.05.06.00
37.06.01.00
37.06.02.00
37.06.03.00
37.06.06.00
37.07.01.00
37.07.02.00
37.08.01.00
37.08.02.00
37.08.04.00
37.09.01.00
37.09.05.00
37.12.01.00
37.12.02.00
37.12.03.00
37.01.01.00*
37.01.02.00*
37.01.04.00*

* Welding Support

### Tune Up & Auto Air Conditioning Repairman

37.05.01.00
37.05.02.00
37.05.03.00
37.05.04.00
37.05.05.00
37.05.06.00
37.06.01.00
37.06.02.00
37.06.03.00
37.06.04.00
37.06.05.00
37.06.06.00
37.07.01.00
37.07.02.00
37.08.01.00
37.08.02.00
37.08.03.00
37.08.04.00
37.08.05.00
37.09.01.00
37.11.01.00
37.11.02.00
37.11.03.00
37.11.04.00
37.11.05.00
37.11.06.00
37.11.07.00
37.12.01.00
37.12.02.00
37.12.03.00

## General Mechanic

37.03.01.00
37.03.02.00
37.03.03.00
37.03.04.00
37.03.05.00
37.03.06.00
37.03.07.00
37.04.01.00
37.04.02.00
37.04.03.00
37.04.04.00
37.04.05.00
37.04.06.00
37.05.01.00
37.05.02.00
37.05.03.00
37.05.04.00
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37.06.02.00
37.06.03.00
37.06.04.00
37.06.05.00
37.06.06.00
37.07.01.00
37.07.02.00
37.08.01.00
37.08.02.00
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37.09.05.00
37.09.06.00
37.10.01.00
37.10.02.00
37.10.03.00
37.10.04.00
37.10.07.00
37.10.08.00
37.12.01.00
37.12.02.00
37.12.03.00
36.01.01.00*
36.01.02.00*
36.01.03.00*
36.01.04.00*
36.02.01.00*
36.02.02.00*
36.02.03.00*

* Welding Support

## Transmission Mechanic

37.10.01.00
37.10.02.00
37.10.03.00
37.10.04.00
37.10.05.00
37.10.06.00
37.10.07.00
37.10.08.00
37.12.01.00
37.12.02.00
37.12.03.00

## Brake & Front-End Mechanic

37.03.01.00
37.03.02.00
37.03.03.00
37.03.04.00
37.03.05.00
37.03.06.00
37.03.07.00
37.04.01.00
37.04.02.00
37.04.03.00
37.04.04.00
37.04.05.00
37.04.06.00
37.12.01.00
37.12.02.00
37.12.03.00
36.01.01.00*
36.01.02.00*
36.01.03.00*
36.01.04.00*
36.02.01.00*
36.02.02.00*
36.02.03.0[illegible]
36.02.05.00*

* Welding Support

## Engine Rebuilder

37.09.01.00
37.09.02.00
37.09.03.00
37.09.04.00
37.09.05.00
37.09.06.00
37.09.07.00
37.12.01.00
37.12.02.00
37.12.03.00

## Small Engine Mechanic

All CA 38 Units
36.01.01.00*
36.01.02.00*
36.01.03.00*
36.01.04.00*
36.02.01.00*
36.02.02.00*
36.02.03.00*
36.02.05.00*

* Welding Support

The cost per hour figures are taken from estimates for fiscal year 1975 (ending August 31, 1975). The most expensive job title is, of course, General Mechanic, with $2,207 per completing student. Tune Up & Engine Repairman approximates this with a mean of $1,633.99. To compute the total cost of producing one job title completer, one needs to add the cost of Welding Support for that job title. Since only two job titles produced completers in both major areas of instruction and support, it is not possible to compute costs for all job titles. Mean total cost for one General Mechanic was $2,520.17, and $1,611.96 for one Brake & Front End Mechanic.

Cost efficiency may be computed by dividing total cost for completers by total adjusted cost. General Mechanic, for example, produced 11 completers (Category V) and 12 non-completers (Category D). Total cost for the 11 completers was $27,721.87. Total cost for all 23 General Mechanics was $36,832.87, giving the job title a cost efficiency of 75.3%. Total cost for all Automotive job titles (including support) was $51,706.62; $37,053.01 of this amount or 71.7% was spent on completers. The rate for Small Engines was 93.7%. Efficiency of all of Mobility & Transportation was 77.6%; that is, $55,125.21 out of $70,994.70 is spent on completers (the difference of $18,861.08 between the total given here and the total figure in Table 5.3 is attributable to the seven General Mechanics in Category I not included in computation).

## Table 5.3
## Mobility & Transportation Completion Characteristics

### CA 36-Welding Support

| | Enrolled | Mean Budgeted Hrs | S.D. | Mean Attended Hrs | S.D. | Cost/Hr | Cost/Student |
|---|---|---|---|---|---|---|---|
| (General Mechanic) | | | | | | | |
| V | 11 | 85.8 | 7.2 | 141.5 | 85.3 | $2.21 | $ 312.72 |
| I | 7 | 81.7 | 7.9 | 239.9 | 99.6 | 2.21 | 530.18 |
| D | 12 | 84.6 | 7.7 | 69.2 | 85.2 | 2.21 | 152.93 |
| T | 30 | 84.4 | 7.5 | 135.6 | 108.5 | 2.21 | 299.68 |
| (Transmission Mechanic) | | | | | | | |
| D | 3 | 90.7 | 4.0 | 0.0 | 0.0 | $2.21 | $ 0.00 |
| T | 3 | 90.7 | 4.0 | 0.0 | 0.0 | 2.21 | 0.00 |
| (Brake & Front End Mechanic) | | | | | | | |
| V | 1 | 89.0 | 0.0 | 194.0 | 0.0 | $2.21 | $ 428.74 |
| D | 2 | 92.5 | 9.2 | 67.5 | 84.1 | 2.21 | 149.18 |
| T | 3 | 91.3 | 6.8 | 109.7 | 94.2 | 2.21 | 242.44 |
| (Tune Up & Engine Repairman) | | | | | | | |
| D | 4 | 78.5 | 9.6 | 28.5 | 51.8 | $2.21 | $ 62.99 |
| T | 4 | 78.5 | 9.6 | 28.5 | 51.8 | 2.21 | 62.99 |
| (Light Duty Mechanic) | | | | | | | |
| D | 1 | 18.0 | 0.0 | 0.0 | 0.0 | $2.21 | $ 0.00 |
| T | 1 | 18.0 | 0.0 | 0.0 | 0.0 | 2.21 | 0.00 |
| (Small Engine Mechanic) | | | | | | | |
| V | 10 | 100.5 | 6.5 | 89.6 | 37.1 | $2.21 | $ 198.02 |
| D | 2 | 98.0 | 7.1 | 0.0 | 0.0 | 2.21 | 0.00 |
| T | 12 | 100.1 | 6.3 | 74.7 | 48.4 | 2.21 | 165.09 |
| All Welding Support | | | | | | | |
| V | 22 | 92.6 | 9.9 | 120.3 | 70.7 | $2.21 | $ 265.86 |
| I | 7 | 81.7 | 7.9 | 239.9 | 99.6 | 2.21 | 530.18 |
| D | 24 | 83.3 | 16.5 | 45.0 | 71.1 | 2.21 | 99.45 |
| T | 53 | 87.0 | 13.8 | 102.0 | 98.0 | 2.21 | 225.42 |

Total Cost: $11,947.26

### CA 37-Automotive

| | Enrolled | Mean Budgeted Hrs | S.D. | Mean Attended Hrs | S.D. | Cost/Hr | Cost/Student |
|---|---|---|---|---|---|---|---|
| General Mechanic | | | | | | | |
| V | 11 | 1021.8 | 12.5 | 833.0 | 258.3 | $2.65 | $2,207.45 |
| I | 7 | 1029.4 | 2.5 | 816.7 | 182.8 | 2.65 | 2,164.26 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| D | 12 | 1019.5 | 19.8 | 228.8 | 269.9 | $2.65 | $ 606.32 |
| T | 30 | 1022.7 | 14.8 | 587.5 | 382.5 | 2.65 | 1,556.88 |
| Transmission Mechanic | | | | | | | |
| D | 3 | 590.0 | 0.0 | 12.8 | 11.3 | $2.65 | $ 33.92 |
| T | 3 | 590.0 | 0.0 | 12.8 | 11.3 | 2.65 | 33.92 |
| Engine Rebuilder | | | | | | | |
| D | 1 | 790.0 | 0.0 | 30.0 | 0.0 | $2.65 | $ 0.00 |
| T | 1 | 790.0 | 0.0 | 30.0 | 0.0 | 2.65 | 0.00 |
| Brake & Front End Mechanic | | | | | | | |
| V | 2 | 312.0 | 14.1 | 446.5 | 145.7 | $2.65 | $1,183.22 |
| D | 1 | 317.0 | 0.0 | 52.0 | 0.0 | 2.65 | 137.80 |
| T | 3 | 313.7 | 10.4 | 315.0 | 250.0 | 2.65 | 834.75 |
| Tune Up & Engine Repairman | | | | | | | |
| V | 4 | 542.5 | 5.0 | 616.6 | 301.3 | $2.65 | $1,633.99 |
| D | 4 | 550.0 | 0.0 | 441.0 | 407.9 | 2.65 | 1,168.65 |
| T | 8 | 546.2 | 5.2 | 528.8 | 345.0 | 2.65 | 1,401.32 |
| Light Duty Mechanic | | | | | | | |
| D | 1 | 352.0 | 0.0 | 0.0 | 0.0 | $2.65 | $ 0.00 |
| T | 1 | 352.0 | 0.0 | 0.0 | 0.0 | 2.65 | 0.00 |
| All Automotive | | | | | | | |
| V | 17 | 825.5 | 282.1 | 736.6 | 238.8 | $2.65 | $1,951.99 |
| I | 7 | 1029.4 | 2.5 | 816.7 | 182.8 | 2.65 | 2,164.26 |
| D | 22 | 802.9 | 258.1 | 210.4 | 287.6 | 2.65 | 557.56 |
| T | 46 | 845.7 | 256.3 | 497.1 | 386.5 | 2.65 | 1,317.32 |
| | Total Cost: | $60,601.52 | | | | | |

CA 38-Small Engines

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Small Engine Mechanic | | | | | | | |
| V | 10 | 374.9 | 10.2 | 357.6 | 78.8 | $4.50 | $1,609.20 |
| D | 2 | 378.5 | 2.1 | 135.5 | 163.3 | 4.50 | 609.75 |
| T | 12 | 375.5 | 9.4 | 320.5 | 122.4 | 4.50 | 1,442.25 |
| | Total Cost: | $17,307.00 | | | | | |

TOTAL COST FOR MOBILITY & TRANSPORTATION: $89, 855.78

V = Validate
I = Incomplete
D = Non-Validate
T = Total

## SOCIODEMOGRAPHIC CHARACTERISTICS

Information pertaining to the income, age, work history, educaion, and other points of interest relating to each program family was gathered prior to the family's entry into the program. This information is analyzed in the form of 21 quantifiable variables which may be divided roughly into three categories: education, employment/income, and quality of life. Educational variables include age, years of education, and quantitative and verbal scores on the Wide Range Achievement Test (WRAT). Employment/income consists of monthly salary, other income (including AFDC, welfare, and unemployment), annual family income, and number of weeks unemployed. Quality of life items include family size, use of food stamps, indebtedness, government housing subsidies, and monthly costs of housing and utilities. An investigation was conducted to determine whether or not significant differences exist among the four categories (A, B, C and D) of exiting families with respect to these variables.

Educational variables. Mobility & Transportation students were typically 24 years old (about two years younger than program median) and had finished 10.5 years of public school education. Mathematics and verbal achievement were 6.8 years and 10.8 years, respectively. While educational attainment is fairly close to program norm, achievement scores were approximately one year below norm. Thus the major differences between Mobility & Transportation students and Mountain-Plains students in general are the facts that Mobility & Transportation students are slightly younger and seem to have profited less from their public school experience.

Work/income. Although unemployment ranged from 0 to 52 weeks, the mean number of weeks unemployed was 14.4 (program mean is 15.6). Students averaged about $530/month when employed and earned an average (mean) of approximately $3,850 the year prior to program entry. Both income figures were slightly higher than program norms ($480/month and $3,530/year). These figures are even higher for Small Engines ($535/month and $4,400/year).

Most student families reported no income other than that earned by head of household or spouse. However, seven families reported receipt of AFDC payments, one had received welfare benefits, and twelve had collected unemployment. These figures are fairly typical of Mountain-Plains students in general.

Quality of life. Families characteristically consisted of two parents and one child. Roughly one-third of all families reported using food stamps though none reported receiving any form of housing subsidy. Mean total debts was $722.07, approaching the program average (program mean is $705.40). Housing payments ranged from nothing at all to $185/month with a mean of approximately $50/month (actually the mean payment for those who made a payment was about $80/month). Utilities costs were approximately $17/month.

Summary. Mobility & Transportation student families resemble typical Mountain-Plains families in almost all respects. They are perhaps a bit younger, demonstrate lower achievement, but make slightly more money than other program families. Given these three facts, it is possible that the typical Mobility & Transportation student would have more trouble adjusting to the Mountain-Plains program due to lack of maturity, learning difficulty, and economic adjustment (relative to students in general). It may be well to keep these characteristics in mind when conducting subsequent evaluations.

## Appendix A
## Bloom's Taxonomy of Behavioral Objectives[1]
## (Cognitive Domain)

### Knowledge

1.00 Knowledge. Recall of information.
1.10 Knowledge of specifics. Emphasis is on symbols with concrete referents.
    1.11 Knowledge of terminology.
    1.12 Knowledge of specific facts.

1.20 Knowledge of ways and means of dealing with specifics. Includes methods of inquiry, chronological sequences, standards of judgment, patterns of organization within a field.
    1.21 Knowledge of conventions: accepted usage, correct style, etc.
    1.22 Knowledge of trends and sequences.
    1.23 Knowledge of classifications and categories.
    1.24 Knowledge of criteria.
    1.25 Knowledge of methodology for investigating particular problems.

1.30 Knowledge of the universals and abstractions in a field. Patterns and schemes by which phenomena and ideas are organized.
    1.31 Knowledge of principles and generalizations.
    1.32 Knowledge of theories and structures (as a connected body of principles, generalizations, and interrelations).

### Intellectual Skills and Abilities

2.00 Comprehension. Understanding of material being communicated, without necessarily relating it to other material.
    2.10 Translation. From one set of symbols to another.
    2.20 Interpretation. Summarization or explanation of a communication.
    2.30 Extrapolation. Extension of trends beyond the given data.

3.00 Application. The use of abstractions in particular, concrete situations.

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[1] Adapted from D.L. Krathwohl, stating objectives appropriately for program, for curriculum, and for instructional materials development. Journal of Teacher Education, 1965, 16, 83-92; also appearing in D.E. Payne (Ed.) Curriculum Evaluation. Lexington, Mass.: D.C. Heath & Co., 1974, under the title "Stating Appropriate Educational Objectives," pp. 69-80.

4.00 Analysis. Breaking a communication into its parts so that origanization of ideas is clear.
  4.10 Analysis of elements. That is, recognizing assumptions.
  4.20 Analysis of relationships. Content or mechanical factors.
  4.30 Analysis of organizational principles. What holds the communication together?

5.00 Synthesis. Putting elements into a whole.
  5.10 Production of a unique communication.
  5.20 Production of a plan for operations.
  5.30 Derivation of a set of abstract relations.

6.00 Evaluation. Judging the value of material for a given purpose.
  6.10 Judgment in terms of internal evidence; e.g., logical consistency.
  6.20 Judgments in terms of external evidence; e.g., consistency with facts developed elsewhere.

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN PLAINS COMPONENTS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER VI - SUMMARY

JULY 1976

MOUNTAIN-PLAINS
EDUCATION
ECONOMIC
DEVELOPMENT
PROGRAM INC

187-A

# INTRODUCTION TO INSTRUCTIONAL/CURRICULUM EVALUATION REPORT SERIES

Instructional/Curriculum Evaluation constitutes one aspect of the evaluative process of Mountain-Plains. Reports in this series, together with reports from External and Affective evaluation series, will provide a thorough documentation of the processes and products of Mountain-Plains. Major subdivisions of the series include:

1. User Trial Reports
2. Descriptive Characteristics
3. Summative Analysis
4. Reliability and Validity Studies
5. Student Evaluation of Staff and Curriculum

Individual reports in each series are currently available from, or are in the process of being incorporated into, the ERIC retrieval system. By the conclusion of the NIE research cycle, Instructional/Curriculum Evaluation Reports will number about 40 or 50. Many reports span two or more areas. These include overall internal evaluation reports and reports on the effects of affective variables on cognitive performance.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program research, and requires some indulgence on the part of the reader.

# SUMMATIVE INTERNAL EVALUATION OF MOUNTAIN-PLAINS COMPONENTS

## VOLUME I - DESCRIPTIVE CHARACTERISTICS

## CHAPTER VI - SUMMARY

Author:

Michael B. Bunch

July 1976

This Study is a Product of the
Research Services Division

David A. Coyle, Director
David L. Irving, Editor

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# CHAPTER VI
# SUMMARY

Each of the preceding chapters in this volume has dealt with one or more specific curriculum areas. The purpose of the present chapter is to examine in summary all Mountain-Plains curriculum areas, job titles, and the students enrolled in them.

## OBJECTIVES

Objectives for each curriculum area were classified according to Bloom's cognitive taxonomy. With the exception of Family Core Curriculum, each area's objectives represented a wide range of levels of task complexity. Table 6.1 is a summary of the distribution of unit level objectives among the six levels of the Bloom taxonomy.

Table 6.1
Bloom Code Classification of Unit Objectives
of Mountain-Plains Curriculum[1]

| Curriculum Area | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | Total |
|---|---|---|---|---|---|---|---|
| Mathematics Skills | 31 | 2 | 6 | 1 | 0 | 0 | 40 |
| Communication Skills | 42 | 12 | 2 | 3 | 0 | 0 | 59 |
| Office Education[2] | 29 | 0 | 43 | 0 | 3 | 0 | 75 |
| Lodging | 16 | 0 | 10 | 0 | 1 | 0 | 27 |
| Food Services | 10 | 0 | 7 | 0 | 2 | 0 | 19 |
| Marketing & Distr. | 22 | 0 | 12 | 1 | 4 | 1 | 40 |
| Welding Support | 3 | 0 | 8 | 0 | 0 | 0 | 11 |
| Automotive | 56 | 0 | 42 | 0 | 0 | 6 | 104 |
| Small Engines | 34 | 7 | 24 | 0 | 0 | 1 | 66 |
| Health Education | 6 | 3 | 2 | 0 | 0 | 0 | 11 |
| Consumer Education | 5 | 1 | 0 | 0 | 0 | 1 | 7 |
| Home Management | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| Parent Involvement | 11 | 0 | 0 | 0 | 0 | 0 | 11 |
| Carpentry | 6 | 1 | 9 | 0 | 10 | 0 | 26 |
| Electronic Assembly | 4 | 0 | 10 | 0 | 1 | 2 | 17 |

---

[1] 1.00 = Knowledge; 2.00 = Comprehension; 3.00 = Application; 4.00 = Analysis; 5.00 = Synthesis; 6.00 = Evaluation

[2] Curriculum area also contains psychomotor and affective objectives.

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| Electrical Wiring | 10 | 0 | 9 | 0 | 13 | 0 | 32 |
| Plumbing | 10 | 0 | 6 | 0 | 6 | 0 | 22 |
| Heating Systems | 2 | 0 | 2 | 0 | 2 | 3 | 9 |
| Refrigeration/Cooling | 7 | 0 | 5 | 0 | 1 | 4 | 17 |
| Appliance Repair | 16 | 0 | 13 | 0 | 0 | 13 | 42 |
| Radio & TV Repair | 38 | 0 | 23 | 0 | 4 | 7 | 72 |
| Electric Motor Repair | 7 | 0 | 7 | 0 | 1 | 6 | 21 |
| Drafting | 10 | 4 | 12 | 0 | 0 | 0 | 26 |
| TOTAL | 380 | 30 | 252 | 5 | 48 | 44 | 759 |
|  | 50.0 | 4.0 | 33.2 | 0.7 | 6.3 | 5.8 |  |

In general, about half of all unit objectives are Level 1.00, Knowledge. The other half are unevenly dispersed among the other five levels. If one assumes a stepwise dependency from level to level, then it is surprising to find far more Level 3.00 objectives than Level 2.00 (33.2% vs. 4.0%). This finding suggests that, in many instances, students are expected to apply their knowledge before comprehending it. A similar situation exists with Levels 4.00, 5.00, and 6.00. Less than one percent (0.7%) of all objectives are Level 4.00 (Analysis), while Levels 5.00 and 6.00 (Synthesis and Evaluation) account for 12.1% of the objectives. This indicates that, in a number of instances, students make cognitive leaps from application of principles to synthesis of information and evaluation of situations without pausing to analyze components or their interrelationships. With individuals whose problem solving skills are highly sophisticated, this is a very effective learning strategy; analysis is implicit, rather than explicit. However, it should not be assumed that the student population served by Mountain-Plains possesses such high level problem solving skills.

## COMPLETION CHARACTERISTICS

Overall job title completion rate was 69%. This figure varied greatly from job title to job title and among curriculum areas. Table 6.2 is a summary of completion characteristics by job title.

## Table 6.2
## Completion by Job Title

| Job Title | Completers | | Total |
|---|---|---|---|
| | n | % | |
| Clerk Stenographer | 13 | 59 | 22 |
| Clerk Typist | 27 | 77 | 35 |
| Bookkeeper | 15 | 63 | 24 |
| Keypuncher | 11 | 85 | 13 |
| Clerk | 3 | 75 | 4 |
| Accounting Clerk | 1 | 50 | 2 |
| Office Education Subtotal | 70 | 70 | 100 |
| Assistant Manager Trainee | 5 | 42 | 12 |
| Desk Clerk | 1 | 50 | 2 |
| Second Baker | 3 | 75 | 4 |
| Chef Trainee | 2 | 67 | 3 |
| Restaurant Mgr. Trainee | 4 | 80 | 5 |
| Restaurant Cook | 1 | 100 | 1 |
| Institutional Cook | 2 | 67 | 3 |
| Bakery Mgr. Trainee | 0 | 0 | 1 |
| Mid-Management Trainee | 12 | 71 | 17 |
| Professional Salesperson | 3 | 60 | 5 |
| Checker/Cashier | 4 | 100 | 4 |
| General Salesperson | 2 | 100 | 2 |
| Subtotal for Marketing & Tourism | 39 | 66 | 59 |
| General Mechanic | 11 | 48 | 23* |
| Transmission Mechanic | 0 | 0 | 3 |
| Engine Rebuilder | 0 | 0 | 1 |
| Brake & Front End Mechanic | 2 | 67 | 3 |
| Tune Up & Engine Repairman | 4 | 50 | 8 |
| Light Duty Mechanic | 0 | 0 | 1 |
| Small Engine Mechanic | 10 | 83 | 12 |
| Subtotal for Mobility & Transportation | 27 | 53 | 51 |
| Carpenter | 14 | 74 | 19 |
| Electrical Wireman | 4 | 100 | 4 |
| Plumber | 8 | 89 | 9 |
| Heating Systems Serviceman | 3 | 100 | 3 |
| Refrigeration/Cooling | 4 | 57 | 7 |
| Radio & TV Repairman | 18 | 90 | 20 |
| Electric Motor Repairman | 3 | 100 | 3 |
| Draftsperson | 18 | 67 | 27 |
| Subtotal for Building Trades | 72 | 78 | 92 |
| Total For All Job Titles | 208 | 69 | 302 |

* Adjusted; 7 students still enrolled in program.

The overall completion rate of 69% is a slightly deflated figure for program completion due to the fact that some students start more than one job title. For example, a student who begins training as a Draftsperson, switches to Small Engine Mechanic, and completes as a Small Engine Mechanic is counted as a non-completer in Drafting and as a completer in Small Engines. Program completion is actually 74%.

Mountain-Plains defines four categories (A, B, C, and D) of exiting student families. Category A families are those in which both spouses complete occupational preparation. A Category B family is one in which only the head of household completes job title training and the spouse completes Family Core Curriculum (this category includes all single heads of household). Category C families are those in which the head of household completes occupational preparation, but the spouse fails to complete any portion of the program. Category D families are those families who resign, desert, or are administratively exited from the program. For the 199 stabilization phase families exiting the program as of June 30, 1976, 70 were Category A (35.2%), 68 Category B (34.2%), 9 Category C (4.5%) and 52 Category D (26.1%). A total of 147 families out of 199 (73.9%) actually completed the program.

## SOCIODEMOGRAPHIC CHARACTERISTICS

Information pertaining to the income, age, work history, education, and other points of interest relating to each program family was gathered prior to the family's entry into the program. This information is analyzed in the form of 21 quantifiable variables which may be divided roughly into three categories; education, employment/income, and quality of life. Educational variables include age, years of education, and quantitative and verbal scores on the Wide Range Achievement Test (WRAT). Employment/income consists of monthly salary, other income (including AFDC, welfare, and unemployment), annual family income, and number of weeks unemployed. Quality of life items include family size, use of food stamps, indebtedness, government housing subsidies, and monthly costs of housing and utilities. An investigation was conducted to determine whether or not significant differences exist among the categories of exiting families with respect to these variables. Due to the small sample size of Category C ($n<9$), only three of the groups were used in analysis of variance (ANOVA).

*Educational variables*. The typical head of household was approximately 26 years old and had completed nearly eleven years of school (mean=10.9). Spouses averaged 24 years of age with a mean educational attainment of 10.9 years. WRAT scores reflected verbal achievement above educational attainment and mathematics achievement below educational attainment (WRAT verbal means were 12.0 years for heads of household and 11.7 years for spouses; math achievement scores were 7.7 years for heads of household and 7.9 years for spouses). No significant differences were detected among the various groups with respect to any educational variable.

*Work/income*. Unemployment ranged a full year among the stabilization population (27 families reported no unemployment during the year preceding program entry, while seven families reported being unemployed the entire year). Mean unemployment was 15.6 weeks. Total annual income ranged from $0 to $9,600 with a mean of $3,530.30 and monthly income averaged $482.54.

Aid to Families with Dependent Children (AFDC) averaged $650.95 per year for the 44 families reporting income from this source. Five families reported receiving welfare benefits averaging $839.26 for a twelve month period; 49 families reported receiving unemployment benefits ranging from $32.00 to $3,036.00, averaging $522.66.

5

Major differences were noted among the completion categories with respect to mean annual income and AFDC payments. ANOVA for income yielded a F value of 16.6 ($p < .01$). Pairwise comparisons revealed that Category A families had larger annual incomes (\$4,388.73) than either Category B families (\$3,043.81) or Category D families (\$2,823.39). The F value for AFDC payments was 38.7 ($p < .01$). Category A families received less than either Category B or D families (\$26.01 for Category A versus \$205.79 for Category B and \$212.82 for Category D).

Quality of life. There were two distinct types of households in the population. Single parent families typically were made up of a mother and one child. Dual parent families also typically had one child. Mean family size was three persons, although this figure varied from two to eight. Roughly 40% (81 families) reported using food stamps, spending an average of \$48.46 for \$76.20 worth of stamps.

Debts averaged \$705.40 but ranged from \$0 to \$4,400. Most families owed less than \$1,000. Housing patterns revealed that families typically rented (64% in this category), although 8.4% reported owning their own home, and 27.1% reported living with friends or relatives. Mean monthly payments for housing were \$61.43. If those families not making monthly housing payments are excluded from consideration, this figure increases to \$85.25 per month. Utilities averaged \$21.32 per month. Maximum amounts paid for housing and utilities were \$250 and \$102, respectively.

The only area of significant differences among the three completion categories considered was indebtedness. ANOVA yielded an F value of 3.04 ($p=.05$). Category A families owed significantly more money (\$791.45) than Category D families (\$493.31). No significant differences were found between Categories

A and B or Categories B and D.

Summary. Analysis of precenter characteristics reveals a continuation of the pattern of unemployment/underemployment of the Mountain-Plains target population. Most families (95%) earned $7,000 or less during the year prior to program entry; 50% earned $3,500 or less. Use of government subsidies (food stamps, housing subsidies, etc.) were fairly minimal, given the economic characteristics of the group.

The major differences among completion categories (income, AFDC, and debts) all have to do with money. While Category A families make the most money, owe the most money, and receive less in AFDC, exactly the reverse is true for Category D families and to a slightly less extent for Category B families. Much of the variation may be explained in terms of relative proportions of single parent families in each group. Category A, by definition, has no single parent families. Categories B and D, on the other hand, are 40% single parent families (51.5% in Category B and 28.9% in Category D). Single heads of household are much more likely to receive AFDC and typically earn less money. Commensurately, they also typically have fewer and smaller outstanding debts. Since in no instance was there a significant difference between Category B and Category D, this rationale is held as the best possible explanation of completion category differences.

# Appendix A
# Bloom's Taxonomy of Behavioral Objectives[1]
## (Cognitive Domain)

## Knowledge

1.00 Knowledge. Recall of information.
1.10 Knowledge of specifics. Emphasis is on symbols with concrete referents.
    1.11 Knowledge of terminology.
    1.12 Knowledge of specific facts.

1.20 Knowledge of ways and means of dealing with specifics. Includes methods of inquiry, chronological sequences, standards of judgment, patterns of organization within a field.
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    1.22 Knowledge of trends and sequences.
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    1.32 Knowledge of theories and structures (as a connected body of principles, generalizations, and interrelations).

## Intellectual Skills and Abilities

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    2.20 Interpretation. Summarization or explanation of a communication.
    2.30 Extrapolation. Extension of trends beyond the given data.

3.00 Application. The use of abstractions in particular, concrete situations.

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[1] Adapted from D.L. Krathwohl, stating objectives appropriately for program, for curriculum, and for instructional materials development. Journal of Teacher Education, 1965, 16, 83-92; also appearing in D.E. Payne (Ed.) Curriculum Evaluation. Lexington, Mass.: D.C. Heath & Co., 1974, under the title "Stating Appropriate Educational Objectives," pp. 69-80.

4.00 Analysis. Breaking a communication into its parts so that origanization of ideas is clear.
  4.10 Analysis of elements. That is, recognizing assumptions.
  4.20 Analysis of relationships. Content or mechanical factors.
  4.30 Analysis of organizational principles. What holds the communication together?

5.00 Synthesis. Putting elements into a whole.
  5.10 Production of a unique communication.
  5.20 Production of a plan for operations.
  5.30 Derivation of a set of abstract relations.

6.00 Evaluation. Judging the value of material for a given purpose.
  6.10 Judgment in terms of internal evidence; e.g., logical consistency.
  6.20 Judgments in terms of external evidence; e.g., consistency with facts developed elsewhere.

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# RELIABILITY/VALIDITY ANALYSIS OF MOUNTAIN-PLAINS TESTS

AUGUST 1976

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

# RELIABILITY/VALIDITY ANALYSIS OF MOUNTAIN-PLAINS TESTS

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Tests & Measurement Specialist

August 1976

This Study is a Product of
Research Services Division

David A. Coyle, Director

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## Author's Note

This report combines two NIE-contracted documents, "Reliability/Validity Analysis of Mountain-Plains Tests" and "Contingency Analysis of Pass/Fail Performance Tests and Master/Non-Master Cognitive Tests." Inasmuch as the contingency analysis performed was a special case of test validity, it was deemed appropriate to combine the two reports. Rather than detracting from the value of either report, the combination was intended to draw the reader's attention to the relatedness of findings of the two investigations and to avoid repetition of methodological issues.

# RELIABILITY/VALIDITY ANALYSIS OF MOUNTAIN-PLAINS TESTS

## INTRODUCTION

The purpose of the present report is to indicate, in fairly detailed fashion, evidence of the reliability and validity of all curriculum-related tests in use at Mountain-Plains. Due to the nontraditional nature of instruction and testing at Mountain-Plains, some exposition on the measurement theory underlying such systems is also considered useful.

Inasmuch as Mountain-Plains instructional procedures are individualized and tests criterion referenced, traditional, variance maximizing approaches to reliability and validity were deemed inappropriate. These methods include Pearsonian-type correlation coefficients (inter-item, item-total, etc.) and analysis of variance approaches to reliability (e.g., Hoyt, 1941; Kuder and Richardson, 1937). Such approaches to reliability rely on maximum score dispersion among students and fail to take into account the possibility of all students scoring extremely high or very low on the test. They also fail to deal with absolute score criteria such as exist in individualized instruction/criterion referenced testing.

Since criterion referenced tests (CRTs) do have absolute cutting points or decision points (that is, predetermined absolute scores below which individuals are classified as requiring further instruction and above which students are regarded as masters of the curriculum content of the test) any assessment of the reliability of the test must logically rely on this decision point. Reliability then becomes a matter of assessing the efficiency of that particular cutting score or the efficacy or consistency of the decisions made based on that criterion point. The question "Does this test accurately and consistently discriminate between masters and non-masters?" is addressed by this process and yields information pertinent to both reliability and validity assessment.

The decision theory approach in the tradition of Cronbach and Gleser (1957) has been advanced in recent years by Hambleton (1974; Hambleton and Novick, 1973) and others who have brought decision theory from a purely personnel selection environment into the domain of criterion referenced testing. The approach involves the assignment of weights or "importance factors" to all possible decisions in terms of the losses created by wrong decisions and benefits associated with correct decisions. Although right and wrong, or correct and incorrect, can only be assessed after the decision has been made, the seriousness of these outcomes may be specified at or before the time of the decision.

A direct, decision-theoretic approach was initially chosen as the method of assessing reliability and validity of Mountain-Plains tests. As more and more information was gathered, it became apparent that such a straightforward approach was quite unwieldy. For example, much of the information pertaining to losses was not only unavailable but also largely inestimable. It was also discovered that decision rules had not been well stated in some instances and that some rules were not consistently adhered to. A modified procedure was therefore developed to assess decision-making efficiency of Mountain-Plains tests.

## RELIABILITY

The method of assessing test reliability involved assessing sensitivity to mastery (as measured by the test). For the purpose of reliability assessment, mastery was defined as scoring at or above a predetermined mastery score (generally set at 80%). Each item was then analyzed in terms of its ability to discriminate between known masters and known non-masters.

Discriminability was based on a chi-square ($X^2$) coefficient derived from a four-fold table comparing item mastery to test (course or unit objective) mastery. The following example is offered to illustrate this procedure applied to one test item:

| | | Item Mastery | | |
|---|---|---|---|---|
| | | Pass | Fail | Total |
| TEST MASTERY | Pass | 7 | 1 | 8 |
| | Fail | 3 | 3 | 6 |
| | Total | 10 | 4 | 14 |

The numbers represent students in each category. Thus, for example, seven students passed both the item and the test; three students passed the item but failed the test (i.e. failed to master the curriculum objective covered by the test). The $X^2$ value computed from this table is 2.36. Going one step further, it is possible to compute a phi coefficient (Ø) which serves as an index of the sensitivity of the item. The Ø computed for this particular example is .41.

This particular statistic is nonparametric and has possible values ranging from -1 to +1. For the purpose of this study, a value of +.30 was considered acceptable. Since Ø is a form of correlation coefficient, it may be regarded as the correlation between item and test. However, since it is based on nonparametric procedures, it is virtually free of the limitations of Pearsonian types of correlation coefficients (e.g. product-moment, biserial, point biserial). The only limitation is in the case of 100% mastery or non-mastery.

Under such conditions, Ø is always 0. When one or more students are classified in each mastery state, the approach yields stable estimates. Reliability of the test is then stated in terms of percentage of acceptable, or sensitive, items.

## VALIDITY

For the purpose of the present study, the primary difference between reliability and validity is in the definition of mastery. While reliability is dependent upon intrinsic definition of mastery, i.e., total test score, validity assessment, while following the same general procedure as used in reliability assessment, will focus on the relationship between cognitive test performance and related job component performances.

Within occupational preparation curriculum there exist real or simulated job component tasks for nearly every unit. As the student completes a segment of instruction, he or she is given not only a cognitive test but one of these activities to perform as well. The validity of the cognitive test is then expressed as the degree of relationship (Ø) between the cognitive test and the performance activity. Four-fold tables are constructed in exactly the same manner as in reliability assessment (cognitive test mastery and performance task mastery). Chi-square and Ø values are then computed. The same conditions prevailing in reliability assessment also hold here. The value of +.30 was adopted as an acceptable level of cognitive/performance relationship.

In some areas there are no performance tasks. These areas include, but are not limited to, Family Core Curriculum (four curriculum areas) and Foundation Education (two curriculum areas). Test validity in these areas was assessed in terms of sensitivity to instruction. For any given curriculum objectives, there exist a specified set of curriculum procedures and materials and a pool of items keyed to the objective. A special (quantifiable) form of content validity would then be a measure of the sensitivity of the item pool to the curriculum objective.

This measure is expressed as a pretest-post test difference score, Dpp (Cox and Vargas, 1966). The rationale for selection of this statistic is simple and straightforward. All students are pretested before entering a curriculum area. Those students who demonstrate mastery on the pretest are not required to receive any instruction in that curriculum area. All entering students are then non-masters. Upon completion of learning activities, all or most students are expected to be masters of the curriculum objective. Any content valid item would then of necessity be characterized by a greater probability of being answered correctly on the post test than on the pretest. Any item which fails to demonstrate a positive pretest-post test change in student response is considered insensitive or irrelevant to the curriculum objective, i.e., it has no content validity. A value of 30% change was adopted as an acceptable level of Dpp.

## METHOD

Students. All students entering the program between 1 December 1974 and 31 July 1975 were included in the analysis. Although occupational preparation is optional for spouses, roughly 75% choose an occupation and receive instruction. The typical student is therefore exposed to Family Core Curriculum, Foundation Education, and some form of occupational preparation as he or she experiences the program. These 204 student families (361 students) have been extensively described elsewhere (Bunch, 1975), but may be briefly characterized as representing a disadvantaged population from the six-state area served by Mountain-Plains. Students are typically in their mid-twenties, having completed about eleven grades of public school, earn just under $4,000 per year, and have experienced 12-13 weeks of unemployment in the year prior to program entry. Approximately one-fourth to one-third of all student families are single parent families. These families differ from dual parent families primarily in terms of income (about $1,200 per year), unemployment (26 weeks per year), and receipt of government subsidies (e.g., 47% received Aid to Families with Dependent Children as opposed to less than 10% for dual parent families).

Tests. All Mountain-Plains curriculum tests are criterion referenced. For each area of instruction, objectives are specified in terms of measurable criteria. These criteria are then translated into performance activities (e.g. framing a window in a house, repairing disc brakes, conducting a sales transaction, composing a letter from dictation, etc.) and cognitive tests.

For the purpose of this analysis, 46 course tests and 208 unit tests were used. Five course tests were taken from Foundation Education, and nine from Family Core Curriculum. Table 1 contains an area-by-area breakdown of course tests analyzed.

Table 1

Course Tests Used in Reliability/Validity Analysis

| | | |
|---|---|---|
| Foundation Education | 5 tests | 215 items |
| Office Education | 5 tests | 184 items |
| Food Services | 4 tests | 140 items |
| Marketing & Distribution | 11 tests | 490 items |
| Family Core Curriculum | 9 tests | 465 items |
| Carpentry | 1 test | 310 items |
| Electrical Wiring | 1 test | 145 items |
| Plumbing | 2 tests | 335 items |
| Appliance Service | 2 tests | 345 items |
| Radio & Repair | 4 tests | 1,060 items |
| Electric Motor Repair | 1 test | 220 items |
| Drafting | 1 test | 130 items |
| TOTAL | 46 tests | 4,039 items |

All items were of a four-option multiple choice format. Non-quantitative assessments of content validity had been made prior to December 1, 1974. On that date, the program entered a period of stabilization in anticipation of final evaluation. No test changes, other than correction of typographical and other clerical errors, were allowed. Most tests had undergone some form of revision prior to December 1, 1974.

Procedure. The methods and approaches previously alluded to were employed in reliability and validity assessments. Students were given course pretests and post tests in a central closely monitored test center. All unit tests, both cognitive and performance, were administered by instructors in each curriculum area. In instances where performance tests existed, students were allowed to proceed to the next curriculum element upon satisfactory completion of the performance task, regardless of cognitive test score. For the purpose of analysis, only first attempts on both types of tests were recorded. Course post tests were given under non-stress conditions; i.e., it was not necessary to demonstrate mastery of curriculum content on a cognitive level. This condition was imposed on the assumption that mastery had already been demonstrated on both cognitive and performance levels (in most instances) prior to post testing. Students were informed of the non-punitive conditions of post testing but requested to try to do their best. The purpose of post testing was explained as an attempt to gather program evaluation data and to determine the quality of the test themselves.

## RESULTS

Reliability. Table 2 shows the distribution of reliable and unreliable items by curriculum area.

Table 2

Course Test Reliability by Curriculum Area

| Curriculum Area | Items with Ø ≥ .30 |  | Total Items |
|---|---|---|---|
|  | N | % |  |
| Foundation Education | 75 | 34.9 | 215 |
| Office Education | 56 | 30.5 | 184 |
| Food Services | 53 | 37.8 | 140 |
| Marketing & Distribution | 178 | 36.4 | 490 |
| Family Core Curriculum | 172 | 37.0 | 465 |
| Carpentry | 96 | 30.9 | 310 |
| Electrical Wiring | 85 | 58.6 | 145 |
| Plumbing | 45 | 13.4 | 335 |
| Appliance Service | 0 | 0.0 | 345 |
| Radio & TV Repair | 206 | 19.5 | 1,060 |
| Electric Motor Repair | 0 | 0.0 | 220 |
| Drafting | 39 | 30.00 | 130 |
| TOTAL | 1,005 | 24.9 | 4,039 |

The total course test item pool may thus be regarded as consisting of about 25% reliable items and 75% unreliable items. In this regard, tests do not seem very reliable.

Although the overall rate is low and virtually all curriculum areas exhibit rather poor course test reliability, four areas have made an extremely poor showing. These areas are Plumbing (13.4%), Appliance Service (0.0%), Radio & TV Repair (19.5%), and Electric Motor Repair (0.0%). Closer inspection reveals that Appliance Service and Electric Motor Repair course tests violated distribution assumptions. Although the method of analysis is virtually insensitive to score distribution, it does have the limiting condition, as do all chi-square methods, of sensitivity to all or none distributions. In the case of these two curriculum areas, no student was classified as a master (as defined by the course post test). In all other instances, unreliability seems to result from a genuine lack of ability to discriminate between masters and non-masters. Non-punitive testing conditions, while they do appear to have had some effect on scores, are not regarded as a major factor affecting reliability.

*Unit test reliability* was much better, as evidenced by Table 3. The overall percentage of acceptable items is 46.3. This figure is increased to 49.4% when the eleven tests violating distribution assumptions are deleted from consideration. That is, about half of all items on unit tests are reliable enough to allow instructors to discriminate between masters and non-masters.

Table 3
Unit Test Reliability by Curriculum Area

| Curriculum Area | Items with $\phi \geq .30$ N | Items with $\phi \geq .30$ % | Total Items |
|---|---|---|---|
| Foundation Education | 132 | 40.0 | 330 |
| Office Education | 91 | 45.5 | 200 |
| Lodging | 70 | 38.9 | 180 |
| Food Services | 11 | 44.0 | 25 |
| Marketing | 342 | 56.5 | 605 |
| Mobility & Transportation | 442 | 47.8 | 925 |
| Family Core Curriculum | 226 | 47.1 | 480 |
| Carpentry | 120 | 27.3 | 440 |
| Electrical Wiring | 14 | 28.0 | 50 |
| Plumbing | 72 | 31.3 | 230 |
| Refrigeration/Cooling | 22 | 44.0 | 50 |
| Appliance Service | 207 | 63.7 | 325 |
| Radio & TV Repair | 71 | 78.9 | 90 |
| TOTAL | 1,820 | 46.3 | 3,930 |

A major difference between Tables 3 and 4 is in the areas of the electrical Building Trades. Appliance Service and Radio & TV Repair (and to some extent, Electrical Wiring) vary greatly in reliability estimates of unit and course tests. Appliance Service and Radio & TV Repair course tests were among the least reliable (0.0% for Appliance Repair and 19.5% for Radio & TV Repair) of all course tests. Unit tests for these areas, however, were the most reliable unit tests of all program areas (63.7% of all Appliance Repair unit test items were acceptable, as were 78.9% of all Radio & TV Repair items). Electrical Wiring, with the most reliable course test items (58.6% were acceptable), had the least reliable unit test items (28.0% were acceptable). In more cases than not, the same items were included in both unit and course tests and yielded different phi coefficients on the two occasions.

Validity. As noted previously, validity was assessed in terms of quantifiable content validity (Dpp) and concurrent validity (Ø coefficient between cognitive test and performance test). Table 4 provides a summary of course test content validity.

Table 4

Course Test Content Validity by Curriculum Area

| | Items with Dpp $\geq$ 30% | | |
|---|---|---|---|
| | N | % | Total Items |
| Foundation Education | 132 | 61.4 | 215 |
| Office Education | 94 | 51.1 | 184 |
| Food Services | 72 | 51.4 | 140 |
| Marketing & Distribution | 171 | 34.9 | 490 |
| Family Core Curriculum | 45 | 9.7 | 465 |
| Carpentry | 80 | 25.8 | 310 |
| Electrical Wiring | 104 | 71.7 | 145 |
| Plumbing | 218 | 65.1 | 335 |
| Appliance Service | 134 | 38.8 | 345 |
| Radio & TV Repair | 666 | 62.8 | 1,060 |
| Electric Motor Repair | 104 | 47.3 | 220 |
| Drafting | 61 | 46.9 | 130 |
| TOTAL | 1,881 | 46.6 | 4,039 |

As shown in Table 4, about half the items in the course test item pool are sensitive to the instructional objectives. By the same token, about half are not. In this instance there are no distribution assumptions to be violated; therefore, the figures may be taken at face value. All areas are fairly close to the norm in terms of percentages of sensitive items except Family Core

Curriculum and Carpentry. Upon closer examination, it was found that the mean pretest-post test difference in probability of answering a given item correctly was 16.2% for Carpentry (35.5% on pretest and 65.5% on post test). Within Family Core Curriculum there was actually a curriculum area which demonstrated a net loss from pretest to post test. The probability of answering any given item correctly on the Home Management pretest was 58.8%. On post test this probability fell to 42.7%, a net loss of 16.1%.

There are three possible explanations of failure of an item or test to demonstrate content validity as expressed by Dpp. Item difficulty, lack of learning (or retention), and irrelevance of the item or test in question could all singly or in concert produce low Dpp values. Item difficulty seems to be the primary factor in the case of Family Core Curriculum. Most items are extremely easy, as evidenced by the mean probability of 61.2% of answering one correctly prior to any instruction. Carpentry test items, on the other hand, are more difficult; the mean pretest probability of obtaining a correct answer is 35.5%, only 10.5% above random guessing. But in this instance, students stand only a 51.7% chance of answering a given item correctly on the post test. Lack of retention is suspected as a contributing factor. This suspicion is based on the fact that Carpentry students spend approximately 70% more time in the area than initially estimated before completing and taking the post test (see Bunch, 1976). This added time would allow for a great deal of forgetting. The effects of non-punitive testing conditions must be ruled out since all curriculum areas are subject to the same conditions.

Concurrent validity coefficients (Ø) of each unit test examined are contained in Table 5.

## Table 5
## Contingency Coefficients for Unit Cognitive Tests vs. Unit Performance Tests

| Unit | Ø |
|---|---|
| Manual and Mechanical Data Processing | .12 |
| Punched Card Data Processing | .62 |
| Introduction to IBM 29 Print Card Punch | .00 |
| Numeric Keyboard Exercises/Program Card | -.06 |
| Introduction to Related Unit Record Equipment | .00 |
| Mail Handling | .00 |
| Communication | .00 |
| Secretarial Recordkeeping | .24 |
| Duplicating Methods | .00 |
| Median Value for Office Education | .00 |
| | |
| Front Desk Responsibilities | .71 |
| Handling of Guest Charges and Credits | .15 |
| Equipment used by the Desk Clerk | .47 |
| Auditing on Miscellaneous Machines | .00 |
| Median Value for Lodging | .31 |
| | |
| Sanitation, Safety, Maintenance, and Equipment Care and Use | .41 |
| Median Value for Food Services | .41 |
| | |
| The Marketing Process | 1.00 |
| Wholesaling | .92 |
| Retailing | 1.00 |
| Shipping | .92 |
| Receiving, Checking, and Marking | .87 |
| Stockkeeping | .85 |
| Basic Human Relations | .86 |
| Understanding Employer--Employee Relations | .86 |
| Application of Mathematics for Selling | .80 |
| Procedures for Inventory, Receiving Merchandise, and Pricing | .89 |
| Face of Cash Register | .85 |
| Operating Checkout Station | 1.00 |
| Checker/Cashier Qualities | .82 |
| Steps of the Sale | .81 |
| Suggestion Selling | .78 |

| | |
|---|---|
| Shopping Services | .80 |
| Sales Preparation | .86 |
| The Selling Process | .81 |
| Special Selling Techniques | .84 |
| Sales Management | .61 |
| Advertising Fundamentals | .85 |
| Promotion | 1.00 |
| Merchandise Buying | .83 |
| Food and Beverage Purchasing | .88 |
| Fundamentals of Finance | 1.00 |
| Merchandise Control | 1.00 |
| Food and Beverage Control | .82 |
| Employee Training | .89 |
| Solving Human Relations Problems | 1.00 |
| Preventing Human Relations Problems | 1.00 |
| Median Value for Marketing | .86 |

| | |
|---|---|
| Safety | 1.00 |
| Bottle and Regulator Construction and Operation | .50 |
| Oxygen-Acetylene Cutting | .67 |
| Fundamentals of Arc Welding | .32 |
| Shop Safety | .75 |
| Basic Tools | .89 |
| Special Tools | .63 |
| Shop Equipment | .70 |
| Fundamentals of Brake Systems | .00 |
| Master Cylinder | .58 |
| Drum Brakes | .45 |
| Disc Brakes | .71 |
| Power Brakes | .85 |
| Emergency Brakes | .81 |
| Fundamentals of Suspension | .60 |
| Tire Balancing | .14 |
| Front-End Alignment | .12 |
| Fundamentals of Electrical Systems | 1.00 |
| Battery Servicing | .59 |
| Starting System | .78 |
| Charging Systems | .33 |
| Lighting Systems | .64 |
| Fundamentals of Fuel Systems | .00 |
| Fuel Pumps | -.08 |
| Fuel Lines and Filters | .32 |
| Fuel Characteristic | 1.00 |
| Automatic Chokes | .47 |
| Fundamentals of Emission Systems | .83 |
| Servicing Emission Systems | .17 |
| Test Engine Condition | .53 |
| Distributor Repair | .25 |
| Adjustments and Repairs | .73 |
| Testing Engine Operation | .48 |
| Fundamentals of 4-Cycle Engines | .85 |
| Engine Construction | .67 |

| | |
|---|---|
| Valve Train | .43 |
| Engine Block | .35 |
| Lubricating Systems | .26 |
| Cooling Systems | .61 |
| Clutches | .73 |
| Fundamentals of Standard Transmission | .80 |
| Standard Transmission | .76 |
| Drive Shafts | .53 |
| Reference Manuals | .76 |
| Parts Manual | .47 |
| Cleaning Parts and Work Area | .00 |
| Oil Changing | .61 |
| Lubrication | .41 |
| Tires | .26 |
| Minor Body Adjustments | .49 |
| Median Value for Mobility & Transportation | .49 |

| | |
|---|---|
| Excavation Layout-Concrete and Forms | .00 |
| Floor and Wall Framing | .00 |
| Ceiling Framing | .00 |
| Roof | .00 |
| Machine Processes | -.22 |
| Exterior Wall Coverings and Cornice | .00 |
| Windows and Trim | .00 |
| Interior Coverings | .00 |
| Median Value for Carpentry | .00 |

| | |
|---|---|
| Pipe and Fittings Assembly | .00 |
| Pipe and Fittings | .00 |
| Cold Water Supply | .00 |
| Fixtures | .00 |
| Median Value for Plumbing | .00 |

| | |
|---|---|
| Refrigeration Systems | .00 |
| Evacuating, Charging, and Leak Testing Refrigeration Systems | .00 |
| Fundamentals of Refrigeration and Controls | .00 |
| Median Value for Refrigeration/Cooling | .00 |

| | |
|---|---|
| Irons | .24 |
| Roasters | .51 |
| Space Heaters | .67 |
| Water Heaters | .00 |
| Electric Ranges | .36 |
| Gas Ranges | .35 |
| Mixers and Blenders | .25 |
| Vacuum Cleaners and Floor Polishers | .33 |
| Washing Machines | .56 |
| Clothes Dryers | .19 |
| Dishwashers | .30 |

| | |
|---|---|
| Compactor | .24 |
| Median Value for Appliance Service | .32 |
| Crystal Detectors | .16 |
| Regenerative Receivers | .00 |
| Median Value for Radio & TV Repair | .08 |
| Median Value for All Unit Tests | .21 |

As can be seen from Table 5, overall validity of cognitive tests was pulled down by the poor results of Office Education and Building Trades. In most of the instances where the validity coefficient was zero, all students had demonstrated mastery on the performance test. Therefore, it would be impossible for any cognitive test to discriminate among masters and non-masters. The failure rate on these tests suggests that many cognitive tests are more difficult than the performances they are meant to predict. Students must, in effect, overlearn a particular task in order to answer questions about it.

Where this overlearning phenomenon did not occur, results were very gratifying. Marketing unit tests, for example, not only have a median validity of .86, but have consistently high coefficients as well. Only two tests yielded validity coefficients below .80, and seven had perfect validity. Mobility & Transportation tests were also found to be quite valid (median Ø = .59); however, there was much more variability in this area (range of Ø was .00 to 1.00).

Too few unit tests were available for Lodging, Food Services, Plumbing, and Refrigeration/Cooling to allow for meaningful conclusions. However, results from Lodging and Food Services are encouraging. Plumbing and Refrigeration/Cooling demonstrate the overlearning phenomenon discussed previously. Efforts to improve validity in those areas should focus on the difficulty level of test items.

SUMMATIVE IMPLICATIONS

Mountain-Plains curriculum tests generally do that which they are supposed to do. The major task of all tests is to separate students into masters and non-masters. Unit tests typically do a better job of discriminating than do course tests. The primary reason for this difference is proximity to the learning process.

Validity also tends to be more substantial than test reliability. While only one-fourth (24.9%) of all course test items proved to be acceptable in terms of reliability, nearly half (46.6%) of the same items demonstrated an acceptable level of content validity (Dpp). In most respects, validity is the critical aspect of curriculum tests. That tests measure their intended objective and are consistent with other measures of the same objective (i.e., performance tasks) has been fairly well substantiated. The major departures from this condition have been discussed and are due to a number of factors including retention (a time factor), instructional processes, item difficulty, and violations of distribution assumptions of the methods used.

The 123 unit cognitive tests assessed in terms of their contingency relationships with performance tasks represent all major areas of Mountain-Plains curriculum. Non-consideration of a particular test was due either to small sample size or non-existence of a performance task. Results of contingency analyses indicate that, except where there were discrepancies in difficulty levels (i.e., Office Education and some areas of Building Trades), cognitive tests yield remarkably accurate estimates of students' chances of success on the corresponding performance tasks. The implication of this finding is that unit cognitive tests may now be used as diagnostic devices with greater assurance that remediation or advancement recommended on the basis of test scores will be beneficial to the student.

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# INTERNAL EVALUATION OF MOUNTAIN-PLAINS COMPONENTS

## VOLUME II

## SUMMATIVE ANALYSIS

AUGUST 1976

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# INTERNAL EVALUATION OF MOUNTAIN-PLAINS COMPONENTS

## VOLUME II

## SUMMATIVE ANALYSIS

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August 1976

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## INTRODUCTION

Much of the information presented in this volume is a summary of findings of previous analyses, primarily from Volume I, but also from other NIE-contracted documents. The tone of this volume is more subjective than previous descriptive reports. Its purpose is to present, in summative fashion, all research findings pertaining to curriculum components of Mountain-Plains. Objectives, processes, tests, student opinions, and student performances are all included in various analysis.

The order of presentation is identical to that of Volume I. Chapter I summarizes the objectives, test characteristics, and other evaluations of Family Core Curriculum. Chapter 2 covers Foundation Education. Chapter 3 deals with Office Education and Marketing & Tourism. Chapter 4 is a summary of all evaluations of Building Trades, and Chapter 5 focuses on Mobility & Transportation. Chapter 6 summarizes all program evaluation.

The format of Chapters 1 and 2 is as follows:

Summary of objectives and processes
Reliability and validity of tests
Student evaluations of curriculum and staff
Change analysis
Summative implications

The format of Chapters 3-5 is as follows:

Summary of objectives
Summary of characteristics of entering students
Reliability and validity of tests
Student evaluations of curriculum and staff
Employer evaluation of exited students
Change analysis
Summative implications

The primary differences between the first two chapters and the next three are in the analysis of student characteristics and employer evaluations.

## OBJECTIVES AND PROCESSES

Objectives of each curriculum area were detailed in Volume I. Processes are defined as those activities associated with specific curriculum objectives and whose purpose it is to enable students to master those objectives. Objectives and processes are evaluated from the points of view of level of complexity (as measured by Bloom's cognitive taxonomy), agreement between objective and process, and sequencing (i.e., determining whether or not activities progress from simple to complex).

## RELIABILITY AND VALIDITY TESTS

Information contained in this section is taken from Bunch (1976). A brief reiteration of the method of assessment is offered here, but the reader is directed to the earlier report for a more detailed description. The assessment of reliability of criterion referenced tests must rely on decision points rather than score distributions. Because traditional reliability estimates (e.g., KR-20, KR-21, coefficient alpha, r) rely on the latter, they had to be eliminated from consideration. Although recent developments in the theory of criterion referenced tests (CRTs) have made it possible to determine reliability (cf. Swaminathan, Hambleton & Algina, 1974), Mountain-Plains data did not fit the requirements of this reliability coefficient. An alternative was developed which assesses the reliability of each item in terms of its ability to discriminate between masters and non-masters as defined by a predetermined cutoff score (decision point). Tests are then evaluated in terms of total number of reliabile items.

Validity is assessed in much the same manner. For those tests where concurrent validity is possible, i.e., where there are both cognitive and performance tests for a single objective, a phi coefficient is computed. Where no performance tests exist a difference measure, Dpp (Cox and Vargas, 1966) is used.

## CHARACTERISTICS OF ENTERING STUDENTS

Volume I chapters contained a section on sociodemographic characteristics of students entering each curriculum area. In this volume, these characteristics are combined with vocational descriptors. Information taken from the General Aptitude Test Battery, Ohio Vocational Interest Survey, and the Minnesota Importance Questionnaire is used. These three instruments were factor analyzed, and the resultant factors were used to develop profiles for each student. Students were then grouped on the basis of profile similarity. The general method of profile grouping was computation of a generalized distance measure ($D^2$). For a more detailed description of the method, the reader is directed to Bunch, Conrad, Lewis, and Manley (1976) and Schoenfeldt (1970, 1972).

Six internally homogeneous male groups and nine female groups emerged from the analysis. The differences between, and among, these groups, as well as the factors yielded by the three instruments, are described in Bunch *et al* (1976).

## EMPLOYER EVALUATIONS

This section deals with evaluations solicited from employers of exited Mountain-Plains students. The evaluation forms used are extremely detailed and cover not only the quality of the student/employee's work but the relevance of skills acquired at Mountain-Plains. The methodology of this activity is described in detail by Myers (1976) and Pollack (1975c).

## STUDENT EVALUATIONS

As students complete or depart (without completing) a particular curriculum area, they are asked to evaluate the instructor and the curriculum materials.

Evaluations are received in the form of two Likert type questionnaires of 20 items (instructor) and 22 items (curriculum). Each form has been previously analyzed by the method of categorical judgement (Thurstone, 1927; Torgeson, 1958). Scale characteristics have been described by Pollack (1975 a, b).

Student Evaluation of Curriculum Form A (SEC-A) consists of 22 items which form two scales of ten items each (two items are not scaled). Scale 1 measures affective attitude toward curriculum and is labelled Affect while Scale 2 measures a number of variables related to relevance, ease, clarity, etc. and is labelled Relevance. Student Evaluation of Staff Form A (SES-A) is an instructor evaluation form of 20 items and two scales of ten items each. Scale 1 measures student/instructor interactions and is labelled Rapport. Scale 2 is a measure of instructor competencies and is labelled Competence.

Each scale is extremely homogeneous (coefficient alphas are typically in the low to mid .90's). Scale scores range from 10 to 60 with lower scores indicating more favorable impressions. A cutoff of 30 has been set as the line of demarcation between favorable and unfavorable. In order to determine if an instructor is favorably perceived, scale score means are adjusted by the standard error of measurement (SEM) to determine a score range. If a set of evaluations, extended in this fashion, contains the value 30 within its range, the instructor or curriculum area can not be judged to be perceived favorably by students.

# CHAPTER 1
# FAMILY CORE CURRICULUM

Family Core Curriculum is composed of Health Education (CA 51), Consumer Education (CA 61), Home Management (CA 63), and Parent Involvement (CA 66). These four curriculum areas together form a core of family oriented instruction, a unique element of Mountain-Plains. All Mountain-Plains students are required to enroll in Family Core Curriculum before proceeding to occupational preparation. The four curriculum areas have a combined total of nine courses, 29 units, and 96 learning activity packages (LAPs).

## OBJECTIVES AND PROCESSES

Some of the LAPs in Family Core Curriculum contain more than one objective; the 96 LAPs have a total of 107 objectives. Each of these objectives has been evaluated in terms of level of activity required. Code numbers from Bloom's Taxonomy (Cognitive Domain) were applied. A complete list of LAP objectives and Bloom code numbers is contained in Volume I Chapter 1 (Appendix A-1).

The six levels of the Bloom code are Knowledge (1.00), Comprehension (2.00), Application (3.00), Analysis (4.00), Synthesis (5.00), and Evaluation (6.00). Of the 107 Family Core Curriculum LAP objectives, only seven (6.5%) were above the Knowledge level. All seven of these objectives were found in Health Education (Curriculum Area 51). At the unit level, seven out of 35 objectives (20%) were above Level 1 (Knowledge). One objective was classified at Level 6. Objective 61.01.02.00 may be classified as 6.20 (evaluation by external criteria) and is stated:

> To be able to evaluate your family's needs, preferences, and capabilities versus the available housing options in order to choose the best housing alternative for you.

However, the unit learning processes are generally on a much lower level. A great deal of attention is given to housing vocabulary and factual information, but very little is devoted to evaluation of needs and options. Materials for this unit consist of a tape recording and three instructor-written LAPs. Some very useful decision-oriented material is presented in the LAPs, but this information is not reflected on an evaluative level on the LAP or unit tests. For example, the student is shown through a pro and con type presentation the advantages and disadvantages of renting and buying, apartment vs. mobile home vs. condominium, etc. Given these tools, a family should be able to make a decision about housing. The test items do not press for such a decision, nor is it apparent that such a decision, even in simulation, is required for the student to complete the unit. The following is typical of test items for the unit:

> Which of the following is true of home ownership?
> a. it is much less an expense than an investment.
> b. it is usually as cheap as renting.
> c. it is always a good investment.
> d. it has many "hidden" costs.

The correct answer is d.

This particular unit was singled out because it at least purported to pursue a higher level objective. Its failure to follow through reflects less the design of the unit than the focus of Family Core Curriculum in general. In nearly all other cases, with the occasional exception of Health Education, the objectives and concomitant processes are very low level. Yet the focus of Family Core Curriculum is described as "(to) provide students with the home and personal "life skills" they need for successful employment." (Wall, 1975). The discrepancy between stated global objectives and subordinate objectives and processes carries through to test reliability and validity, student evaluations, and change data.

## TEST RELIABILITY AND VALIDITY

Reliability results. A criterion level of .30 was set for Ø. Table 1.1 is a summary of all Family Core Curriculum course and unit tests in terms of number of acceptable items.

Table 1.1
a. Course Test Reliability

| | Items with Ø-.30 | | |
|---|---|---|---|
| Course Name | N | % | Total Items |
| Introduction to Health Education | 5 | 10.0 | 50 |
| Family Health | 64 | 80.0 | 80 |
| Consumer Education | 3 | 3.5 | 85 |
| Home Management | 50 | 62.5 | 80 |
| Interaction with Children | 12 | 60.0 | 20 |
| Infant and Toddler | 10 | 25.0 | 40 |
| Pre-School Child | 17 | 37.8 | 45 |
| Middle-Age Child | 1 | 2.2 | 45 |
| Adolescence | 10 | 50.0 | 20 |
| TOTAL | 172 | 37.0 | 465 |

b. Unit Test Reliability

| | | | |
|---|---|---|---|
| Health Information | 5 | 50.0 | 10 |
| First Aid | 2 | 5.0 | 40 |
| Major Health Problems | 9 | 25.7 | 35 |
| Home Care of the Ill | 3 | 12.0 | 25 |
| Family Life Education | 6 | 40.0 | 15 |
| Dental Hygiene | 5 | 50.0 | 10 |
| Managing Your Money | 6 | 60.0 | 10 |
| A Place to Live | 9 | 60.0 | 15 |
| Car Buying | 10 | 66.7 | 15 |
| Shopping with Credit | 9 | 90.0 | 10 |
| Consumer Awareness | 12 | 80.0 | 15 |
| Insurances | 12 | 60.0 | 20 |
| Understanding Nutrition | 7 | 70.0 | 10 |
| Nutrition and Your Health | 9 | 60.0 | 15 |
| Grooming and Impressions | 10 | 50.0 | 20 |
| Clothing and Dress | 10 | 66.7 | 15 |
| Home Care and Utilization | 7 | 46.7 | 15 |
| Self-Image | 7 | 46.7 | 15 |
| Self-Control | 9 | 90.0 | 10 |
| Growth and Development (Infant) | 6 | 60.0 | 10 |
| Care of the Infant and Toddler | 8 | 53.3 | 15 |
| Developing the Baby's Potential | 12 | 80.0 | 15 |
| Child Growth and Development | 7 | 70.0 | 10 |
| The Child's Potential | 7 | 23.3 | 30 |

| | | | |
|---|---|---|---|
| Handling Behavior | 8 | 80.0 | 10 |
| Middle Childhood | 12 | 48.0 | 25 |
| Later Childhood | 5 | 25.0 | 20 |
| Growth and Development (Adolescence) | 9 | 60.0 | 15 |
| Developmental Tasks and Adult Guidance | 5 | 50.0 | 10 |
| TOTAL | 226 | 47.1 | 480 |

Only 37% of all Family Core Curriculum course test items demonstrated an acceptable level of reliability. While this is an unacceptable level, it is higher than the percentage for all Mountain-Plains course tests (24.9%). Unit test items fared slightly better; 47.1% had Ø values of .30 or greater. Only one course test, Family Health may be considered as having a sufficient number of discriminating items (80%). Five unit tests contain 80% or more reliable items. These are Shopping with Credit (90%), Consumer Awareness (80%), Self-Control (90%), Developing the Baby's Potential (80%), and Handling Behavior (80%). All other course and unit tests require major revisions before they may be considered as capable of discriminating between masters and non-masters.

Validity results. Inasmuch as there are no performance activities in Family Core Curriculum, all validity estimates are at the item level and expressed in terms of pretest post test differences. A minimum difference of 30% was set as a criterion level for validity assessed in this manner. Table 1.2 contains a summary of course and unit validity.

Table 1.2
a. Course Test Validity

| | Items with Dpp-30% | | |
|---|---|---|---|
| Course Name | N | % | Total Items |
| Introduction to Health Education | 12 | 24.0 | 50 |
| Family Health | 4 | 5.0 | 80 |
| Consumer Education | 17 | 20.0 | 85 |
| Home Management | 4 | 5.0 | 80 |
| Interaction with Children | 0 | 0.0 | 20 |

| | | | |
|---|---|---|---|
| Infant and Toddler | 3 | 7.5 | 40 |
| Pre-School Child | 3 | 6.7 | 45 |
| Middle-Age Child | 2 | 4.4 | 45 |
| Adolescence | 0 | 0.0 | 20 |
| TOTAL | 45 | 9.7 | 465 |

### b. Unit Test Validity

| | | | |
|---|---|---|---|
| Health Information | 0 | 0.0 | 10 |
| First Aid | 12 | 30.0 | 40 |
| Major Health Problems | 1 | 2.9 | 35 |
| Home Care of the Ill | 3 | 12.0 | 25 |
| Family Life Education | 0 | 0.0 | 15 |
| Dental Hygiene | 0 | 0.0 | 5 |
| Managing Your Money | 0 | 0.0 | 10 |
| A Place to Live | 5 | 33.3 | 15 |
| Car Buying | 3 | 20.0 | 15 |
| Shopping with Credit | 2 | 20.0 | 10 |
| Consumer Awareness | 3 | 20.0 | 15 |
| Insurances | 4 | 20.0 | 20 |
| Understanding Nutrition | 1 | 5.0 | 20 |
| Nutrition and Your Health | 0 | 0.0 | 15 |
| Grooming and Impressions | 1 | 6.7 | 15 |
| Clothing and Dress | 0 | 0.0 | 15 |
| Home Care and Utilization | 2 | 13.3 | 15 |
| Self-Image | 0 | 0.0 | 15 |
| Self-Control | 0 | 0.0 | 5 |
| Growth and Development (Infant) | 2 | 20.0 | 10 |
| Care of the Infant and Toddler | 1 | 6.7 | 15 |
| Developing the Baby's Potential | 0 | 0.0 | 15 |
| Child Growth and Development | 1 | 10.0 | 10 |
| The Child's Potential | 2 | 6.7 | 30 |
| Handling Behavior | 0 | 0.0 | 5 |
| Middle Childhood | 2 | 8.0 | 25 |
| Later Childhood | 0 | 0.0 | 20 |
| Growth and Development (Adolscence) | 0 | 0.0 | 15 |
| Developmental Tasks and Adult Guidance | 0 | 0.0 | 5 |
| TOTAL | 45 | 9.7 | 465 |

Because unit pretests are not routinely administered, pretest post test differences were obtained directly from the appropriate course tests, hence, the identical total figures. The extremely low percentages and generally low Dpp values are more a product of high pretest scores than low post test scores. The mean pretest score for all Family Core Curriculum was 61.2%. Mean post test score was 65.6%. This is a net of Dpp of 4.4%. Some areas of Family Core actually posted net losses; the Home Management course test, for example, had a mean pretest item probability of 58.8% (i.e., 58.8% change of answering any given item correctly). The mean post test item probability was 42.7%, a net Dpp of -16.1%.

The overall value of 9.7% gives Family Core Curriculum the lowest percentage of valid items of all program areas. Since these same items are generally more reliable than those of most program areas, the poor validity observed can not be attributed entirely to the items themselves. An alternative explanation would be that students learned very little in the area.

## STUDENT EVALUATION OF STAFF AND CURRICULUM

Curriculum. A total of 1,751 evaluations were received for the four Family Core Curriculum areas, 429 for Health Education, 446 for Consumer Education, 447 for Home Management, and 429 for Parent Involvement. The over means were 18.2 for Scale 1 (standard deviation = 8.2) and 18.0 for Scale 2 (standard deviation = 7.8). Given the extremely large sample sizes, standard errors of measurement were 0.2 for both scales; thus the score range for Scale 1 was 17.8-18.6 and 17.6-18.4 for Scale 2.

Individual curriculum area evaluations ranged from 15.4 to 20.3 for Scale 1 and from 15.5 to 19.3 for Scale 2. Significant differences were found among curriculum areas on both scales. F values (with 3 and 1,747 degrees of freedom) were 27.8 ($p < .01$) and 20.8 ($p < .01$) for Affect and Relevance, respectively. Table 1.3 contains the means and standard deviations of all four curriculum areas on both scales.

Table 1.3
Summary of Curriculum Evaluations of
Family Core Curriculum

| | Scale 1 | | Scale 2 | |
|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. |
| Health Education | 15.4 | 5.8 | 15.5 | 5.6 |
| Consumer Education | 20.3 | 9.2 | 19.3 | 8.7 |
| Home Management | 18.8 | 7.8 | 18.3 | 7.4 |
| Parent Involvement | 18.3 | 9.0 | 17.8 | 8.4 |
| All Areas | 18.2 | 8.2 | 18.0 | 7.8 |

Analyses of variance were followed by Newman-Keuls post hoc tests of significance of pairwise differences. On Scale 1, there was no significant difference between the scores of Home Management and Parent Involvement. All other differences were significant. For Scale 2, Health Education was perceived by students as superior to each of the other three curriculum areas. No other pairwise differences were significant.

Instructors. Seven instructors received a total of 989 evaluations. Scale score means were 18.8 (S.D. = 11.1) for Rapport and 18.5 for Competence (S.D. = 11.4). Allowing for measurement error, score ranges (95% confidence intervals) were 18.1-19.5 for Scale 1 and from 17.7-19.2 for Scale 2. For both scales, score ranges were below 30; indeed, both scales had ranges not exceeding 20. This is an indication of generally very favorable impressions of instructors in Family Core Curriculum

One instructor had a score range exceeding 30 on the Rapport scale, and there were significant differences among instructors on both scales. F values (with 6 and 982 degrees of freedom) were 37.5 for Scale 1 ($p < .01$) and 88.7 for Scale 2 ($p < .01$). Subsequent Newman-Keuls tests revealed that, with respect to both scales, two instructors were consistently perceived as inferior to the other five instructors. One instructor was consistently perceived by students as superior to the other six instructors on both

Rapport and Competence.

Student evaluation summary. According to the opinions of a very large number of students, instructors in Family Core Curriculum have done a very good job. With the exception of one instructor (who received only 11 evaluations resulting in a standard error of measurement of 3.6), all staff were considered as able to work well with students in individualized instruction. All instructors were favorably perceived by students with respect to competence. Curriculum materials and procedures were likewise favorably viewed by students.

## CHANGE ANALYSIS

As pointed out in a previous section, Family Core Curriculum tests were largely insensitive to changes resulting from instruction. Therefore it is difficult and perhaps futile to discuss change for this area at any length. The question of whether culpability rests with tests or instruction remains moot at this point. Informal assessments of Family Core Curriculum, particularly Parent Involvement, are available, however. Students generally show little attitude change with respect to child rearing (as measured by the Child Raising Opinion Questionnaire, or CROQ[1]). Follow-up studies of exited Mountain-Plains students indicate that some significant changes are effected in living conditions and/or life styles which may be related to one or more of the Family Core Curriculum areas. It is not possible at this time, however, to separate the effects of Health Education, Home Management, etc. from the effects of increased income and employment stability.[2]

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[1] R. Pollack, A reliability assessment of the "Child Raising Opinion Questionnaire" Form E-1; EDP #14. Glasgow, MT: Mountain-Plains Press, 1975.

[2] D.D. Myers, Placement report No. 8: Mountain-Plains placement covering the months of November - April. Glasgow, MT: Mountain-Plains Press, 1976.

## SUMMATIVE IMPLICATIONS

It is necessary to point out here that many of the summative implications for Family Core Curriculum have been preempted by acknowledgement of previous formative implications. The relative triviality of many area objectives was recognized, and a major restructuring of Family Core is currently under way. Emphasis has been shifted from low level cognitive to affective objectives. Specific weaknesses in currently existing tests have been detected, and revised forms are being developed pending area reorganization.

Family Core Curriculum is relatively cheap. Costs computed in Volume I totalled $111.51 per completer. Completion is high; over 95% of all students meet all requirements or nominally master all objectives of each of the four curriculum areas. Yet, there is reasonable doubt, based on the existence of low level curriculum objectives and lack of evidence of behavioral change (which may, of course, be largely attributable to poor quality test items) about the effectiveness of Family Core Curriculum.

Student evaluations of curriculum and staff can not be disregarded, and they represent a very different perspective. The apparent discrepancy between poor quality curriculum objectives and tests and very favorable student ratings of curriculum may be resolved by taking notice of the extremely favorable evaluation of instructors. It is quite possible, and indeed likely, that the instructional staff of Family Core Curriculum are aware of gaps and supplement these weak areas with personal knowledge. Because Family Core is the first program area encountered by students (who are likely to be more experienced in evaluating people than instructional materials), impressions of it are likely to be based on the skills of the staff.

The primary difficulty in having staff consistently make up for faulty curriculum lies in the fact that all measures of progress are geared to the poor curriculum. While students may benefit greatly from such experiences, the benefits are not reflected by the tests. Family Core Curriculum may be labelled a success but not in a formal sense. It is interesting to note that many curriculum objectives represent only superficial learning and that there is little real evidence of mastery of these objectives which may not be worth mastering. The assumption of responsibility for this area by Student Services Division (Counseling, Career Guidance, Community Development) represents a logical and promising shift away from a purely cognitive approach to such largely non-cognitive aspects of life as child rearing, family planning, and choosing a place to live.

# CHAPTER 2
# FOUNDATION EDUCATION

Foundation Education consists of the curriculum areas Mathematics Skills (CA 11) and Communication Skills (CA 15). All Mountain-Plains students are administered the California Test of Basic Skills (CTBS) upon program entry and subsequently assigned to a specific level of each curriculum area according to scores on the CTBS as well as declared occupational objectives. Students exit Foundation Education on completion of job title prerequisites for other educational goals (e.g. college entrance, GED test). The Foundation Education area consists of the two curriculum areas just described, 14 courses, 82 units, and 331 LAPs.

## OBJECTIVES AND PROCESSES

Many LAPs have more than one objective. Volume I Chapter 2 identified 108 such LAP objectives (all for Communication Skills) and described them in terms of levels in the Bloom taxonomy.[1] Of this number, 80 (74%) are Level 1.00. There are twelve Level 2.00 objectives, six Level 3.00, nine Level 4.00, and one Level 5.00. There were no Level 6.00 objectives. Mathematics Skills LAP objectives were not described due to the fact that they are fully documented elsewhere.[2]

The dispersion of unit objectives among the six behavior levels of Bloom's cognitive taxonomy parallelled that of LAP objectives. Mathematics Skills had 31 Level 1.00 objectives out of 40 (77.5%), 2 Level 2.00, 6 Level 3.00, and 1 Level 4.00. There were no Level 5.00 or 6.00 objectives for either CA 11 or CA 15. Communication Skills had 42 Level 1.00 objectives out of 59 (71.2%), 12 Level 2.00 objectives, 2 Level 3.00, and 3 Level 4.00. Nearly three-fourths of all Foundation Education objectives were Level 1.00 (73 out of 99, or 73.7%). However, the typical pattern of presentation in both curriculum areas is to start with simple objectives (Levels 1.00 and 2.00) and end with more complex objectives (Levels 3.00 and 4.00). The number of Level 1.00 objectives in Mathematics Skills, for example, declines steadily from 100% in Course 01 to 71% in Course 04. It may be concluded, therefore, that the objectives and associated processes follow an orderly progression to take the student from an entry level of limited mathematical and verbal sophistication to an exit level at which he or she possesses quite complex skills.

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[1] Bloom's cognitive taxonomy: 1.00 = Knowledge; 2.00 = Comprehension; 3.00 = Application; 4.00 = Analysis; 5.00 = Synthesis; 6.00 = Evaluation.

[2] Individualized Learning for Adults, Philadelphia: Research for Better Schools, 1972.

## RELIABILITY AND VALIDITY

Reliability results. A criterion level .30 was set for $\emptyset$. Table 2.1 is a summary of all Foundation Education course and unit tests in terms of number of acceptable items. Only Communication Skills tests were considered (see footnote 2).

Table 2.1
a. Communication Skills Course Test Reliability

| | Items with $\emptyset \geq .30$ | | |
|---|---|---|---|
| Course Name | N | % | Total Items |
| Level E | 19 | 76.0 | 25 |
| Level F | 31 | 62.0 | 50 |
| Level G | 13 | 37.1 | 35 |
| Level I | 0 | 0.0 | 50 |
| Level K | 12 | 21.8 | 55 |
| TOTAL | 75 | 34.9 | 215 |

### b. Communication Skills Unit Test Reliability

|  | Items with Ø -.30 |  |  |
|---|---|---|---|
| Unit Name | N | % | Total Items |
| Root Words | 0 | 0.0 | 10 |
| Recognition and Formation of Plural Words | 0 | 0.0 | 10 |
| Basic Reading Structures | 6 | 30.0 | 20 |
| Complete Sentences | 6 | 60.0 | 10 |
| Alphabetizing | 5 | 50.0 | 10 |
| Word Meanings | 5 | 50.0 | 10 |
| Main Idea and Recall | 3 | 20.0 | 15 |
| Recognition and Formation of Prefixes and Suffixes | 6 | 40.0 | 15 |
| Who, What, Where, and Why | 0 | 0.0 | 20 |
| Capitalization | 5 | 50.0 | 10 |
| The Apostrophe | 5 | 50.0 | 10 |
| Syllabication and Context Clues | 4 | 26.7 | 15 |
| Preparation for Technical Reading | 4 | 26.7 | 15 |
| Subject-Verb Agreement | 5 | 50.0 | 10 |
| Noun Plurals and Guide Words | 4 | 40.0 | 10 |
| Placing Words | 8 | 53.3 | 15 |
| Dewey Decimal System/Card System | 8 | 80.0 | 10 |
| Possessives, Contractions, and Plural Nouns | 5 | 33.3 | 15 |
| Prefixes and Suffixes | 8 | 80.0 | 10 |
| The Eight Parts of Speech | 4 | 26.7 | 15 |
| Verb Forms | 9 | 90.0 | 10 |
| Prefixes and Suffixes | 9 | 90.0 | 10 |
| Terminal Punctuation | 4 | 40.0 | 10 |
| Modifiers | 0 | 0.0 | 10 |
| Pronouns and Prepositions | 8 | 80.0 | 10 |
| Sentence Structure | 4 | 26.7 | 15 |
| Paragraphs into Compositions | 8 | 80.0 | 10 |
| TOTAL | 133 | 40.3 | 330 |

As in the case of Family Core Curriculum tests, Foundation Education unit tests fared slightly better than course tests; 34.9% of all course test items demonstrated an acceptable level of reliability, and 40.3% of unit test items were found to be reliable by the method used. If the unit tests violating distribution assumptions (i.e., those with all masters and no non-masters) are excluded from consideration, the total number of items becomes 280, and the reliable items constitute 47.5% of this number. No distribution assumptions were violated on course tests. Five of the 22 non-violating tests may be regarded as requiring no further development. These are the tests with 80% or more reliable items. All other unit and course tests require major revisions before they can be considered as capable of discriminating between masters and non-masters.

Validity results. Because there are no performance tests in Foundation Education, all validity estimates are at the item level and expressed in terms of pretest post test differences. A minimum difference of 30% was set as a criterion level for validity assessed in this fashion. Table 2.2 is a summary of course test validity.

Table 2.2
Foundation Education Course Test Validity

| | Items with Dpp-30% | | |
|---|---|---|---|
| Course Name | n | % | Total Items |
| Level E | 18 | 72.0 | 25 |
| Level F | 39 | 78.0 | 50 |
| Level G | 25 | 71.4 | 35 |
| Level I | 33 | 66.0 | 50 |
| Level K | 17 | 30.9 | 55 |
| TOTAL | 132 | 61.4 | 215 |

Levels H and J had too few usable tests to be included in analysis. The total figure of 61.4% valid items is one of the highest of all program areas. Although overall validity fell somewhat short of the desired 80%, only minor adjustments are expected with all courses except Level K. The values given in Table 2.2 indicate that 61.4% of all items in Foundation Education are extremely sensitive to the instructional objectives of the area.

## STUDENT EVALUATION OF CURRICULUM AND STAFF

Curriculum. A total of 75 evaluations were received for Foundation Education, 35 for Mathematics Skills, and 40 for Communication Skills. Evaluations reflect a generally very favorable student opinion of the curriculum. Means and standard deviations are included in Table 2.3.

Table 2.3
Summary of Student Evaluations of Curriculum
for Foundation Education

| | Scale 1 | | Scale 2 | |
|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. |
| Mathematics Skills | 19.8 | 8.3 | 18.9 | 7.9 |
| Communication Skills | 22.4 | 11.7 | 20.4 | 9.4 |
| All Foundation Education | 21.2 | 10.2 | 19.7 | 8.7 |

No significant differences were detected between the two curriculum areas on either scale. Although standard errors of measurement were rather large (ranging from 1.3 to 1.8), no scale score range exceeded 30 for either curriculum area. It may be concluded that students were very favorably impressed by the Foundation Education Curriculum.

Instructors. Evaluations of five instructors (three Mathematics Skills and two Communication Skills) were received from 110 students. Scale 1 (Rapport) score means ranged from 17.6 (most favorable) to 26.6 (least favorable). Scale 2 (Competence) score means ranged from 19.4 to 30.0. As pointed out previously, 30.0 was the criterion level, below which instructors were regarded as doing a good job and above which performance was judged as poor.

For the purpose of analysis and comparison, one instructor was not considered due to the small number of evaluations received and subsequently large standard errors of measurement. Of the remaining four instructors, none had score ranges extending above 30 on the Rapport scale, and both Communication Skills instructors scored above the cutoff on the Competence scale.[3] It may be concluded, therefore, that Foundation Education instructors are perceived by students as skilled in instructor-student relationships, but that only Mathematics Skills instructors are uniformly regarded as competent.

## CHANGE ANALYSIS

As pointed out in Volume I, all 29 students completing preparation for the General Educational Development (GED) test subsequently passed the examination (at a nearby testing location) and were awarded GED certificates. This figure represents a stable rate of over 99% success on the GED exam over the past two years.

Gains were also noted on the California Test of Basic Skills (CTBS) in both computational and verbal skills. A mean gain of 2.4 years was noted for mathematics achievement and a mean gain of 1.2 years was noted for communication skills. Allowing for measurement error, reliably interpretable gains of 2.1 years for mathematics and 1.0 years for verbal skills are derived. Time spent in Foundation Education averages 99.5 hours in Mathematics Skills and 49.2 hours in Communication Skills. Thus, gains are being posted in both areas at the rate of .02 years per instructional hour. If linearly plotted (which is not very likely to be appropriate due to the asymptotic nature of learning curves in these two areas), a net gain of 12 years is projected for students spending 600 hours in each curriculum area. While this may be a bit farfetched, some students recorded gains as high as six or seven years.

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[3] Score ranges are computed by extending 1.96 SEM on each side of the mean. Thus, for example, an instructor with a mean of 20.0 and SEM of 2.0 would have a range of 20 ± 3.92 or a range extending from 16.08 to 23.92. The value 1.96 was chosen to yield ranges that could be interpreted with 95% accuracy.

The distribution of CTBS scores follows a classic mastery learning pattern. Post test means are higher and standard deviations are smaller than for pretests. In other words, individuals initially widely dispersed about a relatively low point on a continuum end up tightly grouped around a higher point on the continuum. The concept of aptitude being a function of time required to master a constant curriculum is well illustrated by Mathematics Education. The correlation between CTBS pretest scores and time spent in curriculum is -.84; the lower the score, the longer in the area. Pretest scores in both areas also reflect a ceiling effect. Pearson correlations for pretest CTBS scores vs. CTBS gains are -.70 for math and -.55 for verbal skills. There is an absolute ceiling of 16 on the test and a practical ceiling of approximately 13.5 imposed by the Foundation Education curriculum since no job title requires a higher level of verbal or quantitative functioning.

## SUMMATIVE IMPLICATIONS

Curriculum objectives of Foundation Education are sound and sequential. Tests generally reflect these objectives in a reliable and valid fashion. Costs are very low for the results achieved (e.g., $267.66 for two years of math achievement or $154.00 for one year of verbal achievement). Students favorably perceive curriculum and are generally convinced that instructors are competent.

Regarding this last point, it is somewhat startling to find that of the two instructors in Communication Skills evaluated by students, only one was actually classified as an instructor. The other was an instructional aide. The function of the instructor is to facilitate learning (through review, reinforcement, prescription, etc.) while the role of the aide is to provide clerical support. While both individuals received mean ratings below the cutoff point, both had enough unfavorable ratings to push their reliably interpretable score ranges over the mark, thereby casting some doubt on their competence.

A closer investigation revealed that all GED instruction (in verbal skills) was performed by the instructional aide. Analysis of free-response comments on SES-A revealed that many of the instructional responsibilities assumed by the aide were assumed by default. It was apparent that the instructor was generally unavailable.

While some irregularities in the instructional process have been detected, the larger issue of area performance yields a very positive response. It is unlikely that the cost effectiveness of Foundation Education, simply in terms of CTBS gains, could be repeated elsewhere with methods and materials different from those used by Mountain-Plains. The value of the curriculum is well stated in the fact that students are able to use it, relatively unassisted, and make significant gains in a short period of time.

## CHAPTER 3
## OFFICE EDUCATION AND MARKETING & TOURISM

Office Education and the three curriculum areas making up Marketing & Tourism (Lodging, Food Services, and Marketing) are the focus of this portion of Volume II. The objectives and accompanying processes are viewed along with student characteristics, test quality, employer evaluations, changes, and student evaluations of staff and curriculum in a summative fashion.

### OBJECTIVES AND PROCESSES

The 75 objectives of Office Education are predominately Application (Level 3); 43 are at this level. The remainder of the objectives in Office Education are Knowledge (Level 1) and Synthesis (Level 5). Level 1 accounts for 29 objectives and Level 5 accounts for three.

While the emphasis in Office Education is on skill application, Marketing & Tourism emphasizes knowledge acquisition. Marketing is the only one of the four curriculum areas with any Evaluation (Level 6) objectives. The process is typically one of knowledge acquisition to skill application in Office Education and almost purely knowledge level in Marketing & Tourism. The areas of Office Education and Marketing are viewed as having a fairly sound training process in light of the job titles offered and ultimate goals of those job titles. Lodging and Food Service, on the other hand, could use more skill application. This evaluation is based on the fact that job title descriptions in these areas imply that completers will be placed in positions requiring more than the curriculum apparently prepares them for. Portions of the Food Services curriculum are currently undergoing a revision toward greater skill application and synthesis of concepts. Lodging objectives tend to reflect a lower level of activity than actually takes place.

## STUDENT CHARACTERISTICS

Nearly half of all students who entered Mountain-Plains during the period of stabilization elected career fields in either Office Education or Marketing & Tourism. Office Education alone accounted for 106 out of 361 students. Characteristics of these students, therefore, should generally reflect the attributes of Mountain-Plains students in general. Some exceptions are worth noting.

Food Service students tend to be somewhat older and less verbally oriented than students in general. Marketing students tend to be younger and more verbal. Spouses who enter Office Education tend to have worked and helped support the family to a greater extent than spouses who enter other areas. While Mountain-Plains makes every effort to channel women into non-traditional roles, it is perhaps this work experience which leads the job market wise woman into the traditional secretarial training (most spouses who worked full time prior to coming to Mountain-Plains were employed in clerical positions). Office Education represents a safe, familiar environment, and a decision to enter the area may reflect disenchantment with other types of jobs brought about by unsuccessful attempts to break the sex barrier in such areas as carpentry, mechanics, etc.

Virtually every occupational subgroup (cf. Bunch, Conrad, Lewis, & Manley, 1976) was represented in the four curriculum areas of Office Education and Marketing & Tourism. Men who entered the area were primarily in Marketing, although there were three Bookkeepers. Of the 144 women in all four curriculum areas, 103 were in Office Education, primarily in one of two job titles, Clerk Typist and Clerk Stenographer.

Subgroups 1 and 6 for men and female Group 1 were proportionately over-represented in Office Education and Marketing & Tourism. The women in Group 1 seem to fit this area almost perfectly. They were characterized by high scores on scales measuring artistic/interpersonal interests, general business and management interests, interest in nursing, and affinity for ability utilization. The major implication here is that Career Guidance was successful 15 out of 17 tries for this female subgroup.

The two male subgroups dominating the Office Education and Marketing & Tourism areas had very little in common. In fact, in one instance they were polar opposites. With respect to values placed on productivity, Group 1 men were the highest scorers of all six groups, and Group 6 men scored lowest. Group 1 men were also characterized by intense cultural/literary and technology interests. Group 6 men had high manual service interests but were actually one of the two lowest scoring groups on business interest. Although business occupations may seem inappropriate for this group, especially with regard to their interests, completion rate was roughly equal to that of Group 1 men (62% for Group 6 and 60% for Group 1).

## TEST RELIABILITY AND VALIDITY

A total of 20 course tests and 48 unit tests were considered in reliability assessment. Five course tests were taken from Office Education, four from Food Services, eleven taken from Marketing, and no course tests from Lodging (the number of individuals taking course post tests was too small to warrant conducting reliability assessment). The relative ability of items in these course tests to discriminate between masters and non-masters is summarized in Table 3.1.

Table 3.1
Course Test Reliability by Course

|  | Items with $\phi \geq .30$ |  |  |
|---|---|---|---|
| Course | N | % | Total Items |
| Business Writing | 0 | 0.0 | 10 |
| Data Processing | 17 | 26.2 | 65 |
| Filing | 12 | 24.0 | 50 |
| Keypunch | 9 | 36.0 | 25 |
| Machine Transcription | 18 | 52.9 | 34 |
| Subtotal for Office Education | 56 | 30.5 | 184 |
| Short Order Cook | 22 | 73.3 | 30 |
| Restaurant/Institutional Cook | 18 | 45.0 | 40 |
| Restaurant Manager Trainee | 13 | 65.0 | 20 |
| Second Baker | 0 | 0.0 | 50 |
| Subtotal for Food Services | 53 | 37.8 | 140 |
| Marketing Operations | 13 | 32.5 | 40 |
| Merchandise Distribution Procedures | 2 | 3.3 | 60 |
| Human Relations in Marketing | 12 | 30.0 | 40 |
| Marketing Mathematics | 14 | 46.7 | 30 |
| Cash Register Operation | 26 | 52.0 | 50 |
| Visual Merchandising | 11 | 44.0 | 25 |
| Basic Salesmanship | 9 | 15.0 | 60 |
| Customer Services | 12 | 40.0 | 30 |
| Advanced Salesmanship | 21 | 35.0 | 60 |
| Advertising and Promotion | 25 | 62.5 | 40 |
| Supervisory Skills | 31 | 56.4 | 55 |
| Subtotal for Marketing | 176 | 35.9 | 490 |
| TOTAL | 285 | 35.0 | 814 |

The overall rate of 35.0% is about 10% better than Mountain-Plains course tests in general (24.9%). Two tests, however, violated distribution assumptions. When the course tests for Business Writing and Second Baker are depleted, the percentage of reliable, or discriminating, items climbs to 37.8%.

Twelve unit tests from Office Education, four from Lodging, one from Food Services and thirty-one unit tests from Marketing were also analyzed for reliability. Many tests were eliminated from analysis for obvious distribution violations (0 or 100% mastering the test). Results of these analyses are summarized in Table 3.2.

## Table 3.2
## Unit Test Reliability by Unit

| Unit | Items with $\phi \geq .30$ | | Total Items |
|---|---|---|---|
| | N | % | |
| Introduction to Business Data Processing | 5 | 50.0 | 10 |
| Manual and Mechanical Data Processing | 11 | 55.0 | 20 |
| Punched Card Data Processing | 10 | 66.7 | 15 |
| Common Language Media | 3 | 30.0 | 10 |
| Electronic Data Processing | 9 | 60.0 | 15 |
| Introduction to IBM 29 Print | 5 | 50.0 | 10 |
| Numeric Keyboard Exercises/Program Card | 7 | 70.0 | 10 |
| Introduction to Related Unit Record Equipment | 5 | 50.0 | 10 |
| Mail Handling | 6 | 24.0 | 25 |
| Communication | 7 | 35.0 | 20 |
| Secretarial Recordkeeping | 11 | 36.7 | 30 |
| Processing Data | 7 | 70.0 | 10 |
| Duplicating Methods | 5 | 33.3 | 15 |
| Subtotal of Office Education | 91 | 45.5 | 200 |
| Care of the Rooms | 9 | 45.0 | 20 |
| Introduction to the Front Office | 12 | 48.0 | 25 |
| Front Desk Responsibilities | 7 | 20.0 | 35 |
| Handling of Guest Charges and Credits | 11 | 31.4 | 35 |
| Equipment Used by the Desk Clerk | 21 | 42.0 | 50 |
| Auditing on Miscellaneous Machines | 10 | 66.7 | 15 |
| Subtotal for Lodging | 70 | 38.9 | 180 |
| Sanitation, Safety, Maintenance, and Equipment Care and Use | 11 | 44.0 | 25 |
| Subtotal for Food Services | 11 | 44.0 | 25 |
| The Marketing Process | 10 | 66.7 | 15 |
| Wholesaling | 9 | 60.0 | 15 |
| Retailing | 8 | 80.0 | 10 |
| Shipping | 10 | 40.0 | 25 |
| Receiving, Checking, and Marking | 9 | 45.0 | 20 |
| Stockkeeping | 8 | 53.3 | 15 |
| Basic Human Relations | 4 | 26.7 | 15 |
| Understanding Employer-Employee Relations | 12 | 48.0 | 25 |
| Application of Mathematics for Selling | 12 | 80.0 | 15 |
| Procedures for Inventory, Receiving Merchandise, and Pricing | 12 | 80.0 | 15 |
| Face of Cash Register | 12 | 48.0 | 25 |
| Operating Checkout Station | 9 | 60.0 | 15 |
| Checker/Cashier Qualities | 7 | 70.0 | 10 |
| Steps of the Sale | 16 | 35.6 | 45 |
| Suggestion Selling | 9 | 60.0 | 15 |
| Credit | 4 | 40.0 | 10 |
| Shopping Services | 6 | 30.0 | 20 |
| Sales Preparation | 7 | 70.0 | 10 |
| The Selling Process | 13 | 65.0 | 20 |

| | | | |
|---|---|---|---|
| Special Selling Techniques | 13 | 86.7 | 15 |
| Sales Management | 14 | 93.3 | 15 |
| Advertising Fundamentals | 18 | 60.0 | 30 |
| Promotion | 9 | 90.0 | 10 |
| Merchandise Buying | 24 | 60.0 | 40 |
| Food and Beverage Purchasing | 11 | 31.4 | 35 |
| Fundamentals of Finance | 20 | 57.1 | 35 |
| Merchandise Control | 13 | 86.7 | 15 |
| Food and Beverage Control | 5 | 33.3 | 15 |
| Employee Training | 11 | 73.3 | 15 |
| Solving Human Relations Problems | 15 | 60.0 | 25 |
| Preventing Human Relations Problems | 12 | 80.0 | 15 |
| Subtotal for Marketing | 342 | 56.5 | 605 |
| TOTAL | 514 | 50.9 | 1,010 |

The overall rate of 51.1% is very good. Unit tests in Office Education and Marketing & Tourism (especially in Marketing) are quite capable of discriminating between masters and non-masters.

Validity of area tests was assessed only in terms of pretest - post test differences (Dpp) for the purpose of this report. Results of validity analyses are summarized in Table 3.3.

Table 3.3
Course Test Validity by Course

| Course | Items with Dpp≥30% | | Total Items |
|---|---|---|---|
| | n | % | |
| Business Writing | 6 | 60.0 | 10 |
| Data Processing | 27 | 41.5 | 65 |
| Filing | 29 | 58.0 | 50 |
| Keypunch | 22 | 88.0 | 25 |
| Machine Transcription | 10 | 29.4 | 34 |
| Subtotal for Office Education | 94 | 51.1 | 184 |
| Short Order Cook | 23 | 76.7 | 30 |
| Restaurant/Institutional Cook | 26 | 65.0 | 40 |
| Restaurant Manager Trainee | 12 | 60.0 | 20 |
| Second Baker | 11 | 22.0 | 50 |
| Subtotal for Food Services | 72 | 51.4 | 140 |
| Marketing Operations | 12 | 30.0 | 40 |
| Merchandise Distribution Procedures | 19 | 31.7 | 60 |
| Human Relations in Marketing | 6 | 15.0 | 40 |
| Marketing Mathematics | 4 | 13.3 | 30 |
| Cash Register Operation | 15 | 30.0 | 50 |
| Visual Merchandising | 19 | 76.0 | 25 |
| Basic Salesmanship | 17 | 28.3 | 60 |
| Customer Services | 14 | 46.7 | 30 |

| | | | |
|---|---|---|---|
| Advanced Salesmanship | 24 | 40.0 | 60 |
| Advertising and Promotion | 26 | 65.0 | 40 |
| Supervisory Skills | 15 | 27.3 | 55 |
| Subtotal for Marketing | 171 | 34.9 | 490 |
| TOTAL | 337 | 41.4 | 814 |

Item validity for the courses listed in Table 3.3 is slightly lower than the program norm (46.6). Marketing, in particular, is quite low with 34.9% of all course test items demonstrating discriminant validity. It is interesting to note here that Marketing items were among the most reliable. Validity may be regarded as fair, although many of the course tests need major revisions (the Marketing Mathematics course test is a prime candidate for change).

## STUDENT EVALUATIONS

Curriculum. Evaluations from 124 students were obtained through administration of Student Evaluation of Curriculum Form A (SES-A), 71 for Office Education, 5 for Lodging, 14 for Food Services, and 34 for Marketing. The two scales of SEC-A are labelled Affect and Relevance (cf. Bunch, 1976). Scale scores for each of the four curriculum areas are summarized in Table 3.4.

Table 3.4
Summary of SES-A Scale Statistics by Curriculum Area

| | Scale 1 | | Scale 2 | |
|---|---|---|---|---|
| Curriculum Area | Mean | S.D. | Mean | S.D. |
| Office Education | 17.9 | 8.5 | 16.1 | 7.0 |
| Lodging | 29.0 | 8.9 | 27.4 | 7.2 |
| Food Services | 24.6 | 9.3 | 24.6 | 10.3 |
| Marketing | 18.1 | 7.3 | 16.4 | 6.4 |
| TOTAL | 19.2 | 8.2 | 17.6 | 7.9 |

Confidence intervals for the two scales were 17.8-20.7 for Affect and 16.2-19.0 for Relevance. These ranges do not contain the value 30 or any value above 30; therefore it may be concluded that students generally liked the curriculum and found it relevant to their career aspirations. Only Lodging differed from this pattern. Scale score means were fairly high (29.0 for Scale 1 and 27.4 for Scale 2), and upper scale score limits were both above 30. Affect scores for Lodging curriculum had an upper limit of 36.8, and Relevance had an upper limit of 33.7. These scores are high enough to cause concern over the quality of Lodging curriculum, even given the relatively small sample size (Lodging was evaluated by five students; sixteen students entered the area, and six completed).

It is fairly safe to conclude that, except for Lodging, curriculum in Office Education and Marketing & Tourism is positively perceived by students. This evaluation applies to both subjective and more objective appraisals of the materials and procedures. Student response to Lodging curriculum supports other evaluations of the curriculum expressed in the Objectives and Processes portion of this chapter.

Instructors. A total of 67 instructor evaluations were received. The two scales of Student Evaluation of Staff Form A (SES-A) had means of 16.0 (Rapport) and 16.0 (Competence). Standard deviations were 8.8 and 8.0 for Scales 1 and 2, respectively. Due to the small number of evaluations received for Lodging and Food Services (n=5), instructor evaluations for all of Marketing & Tourism were considered together. Scale means for Office Education were 16.3 (S.D.=10.0) for Scale 1 and 16.7 (S.D.=9.1) for Scale 2. Marketing & Tourism scale score means were 15.4 (S.D.=5.8) for Scale 1 (Rapport) and 15.7 (S.D.=5.6) for Scale 2 (Competence). In every instance it was possible to conclude with at least 95% confidence that scale scores were favorable.

In relation to instructors in other program components, instructors in Office Education and Marketing & Tourism were very favorably perceived. Of the ten areas evaluated, Marketing & Tourism ranked second on both scales, and Office Education ranked third. Both areas received significantly lower (more favorable) scores than Mathematics Skills, Communication Skills, Consumer Education, and Mobility & Transportation. Although not significantly so, scale score means for Office Education and Marketing & Tourism were lower than those for Home Management, Building Trades, and Parent Involvement. Office Education and Marketing & Tourism instructors may therefore be regarded as among the best in the program, at least as far as students are concerned.

## EMPLOYER EVALUATIONS

No employer evaluations were available for Lodging. Otherwise, 25 responses were obtained for Office Education, 5 for Food Services, and 10 for Marketing. Employer evaluations of Office Education completers were extremely favorable. Over 90% of all technical proficiency ratings were satisfactory or better; 95% of employability ratings (attitude, attendance, etc.) were satisfactory or better.

It was apparent that most Mountain-Plains students receiving training in Office Education were employed as clerk typists. Shorthand, for example, was required and observed for only four people; only two used dictaphones. Secretarial services, such as composing business letters, making travel arrangements, and preparing itinerary, were seldom required.

Evaluations received from employers of Food Services completers contained no unsatisfactory ratings on technical skills and 85% satisfactory or better ratings on employability. Nearly two-thirds (65.7%) of all skill ratings were above average or superior. Food Services graduates are thus seen as outstanding in terms of skills and about average (in relation to Mountain-Plains completers in general) with respect to employability traits.

Marketing students received 85.8% satisfactory or better technical skill ratings from their employers. Employability traits were rated equally high with 87.1% favorable or very favorable responses. Four skill areas considered especially important were human relations, mathematics skill, selling ability, and customer service. Marketing students/employees generally excelled in human relations and customer service as well as cash register operation and displays. A more detailed analysis of employer evaluations is available in Bunch & Myers (1976).

## CHANGE ANALYSIS

Completion is an implicit change variable. In this respect, 69% of all students enrolled in Office Education or Marketing & Tourism may be said to have changed from non-masters to masters of a specific curriculum. A summary of the cost of this type of change is contained in Table 3.5.

Table 3.5
Cost Per Completer by Job Title

| Job Title | Cost Per Completer |
|---|---|
| Clerk Stenographer | $1,026.50 |
| Clerk Typist | 493.50 |
| Bookkeeper | 728.50 |
| Keypunch Operator | 389.75 |
| Clerk | 457.00 |
| Accounting Clerk | 173.75 |
| Assistant Manager Trainee | 1,482.47 |
| Desk Clerk | 586.24 |
| Second Baker | 917.86 |
| Chef Trainee | 1,013.03 |
| Restaurant Manager Trainee | 1,124.64 |
| Institutional Cook | 950.81 |
| Restaurant Cook | 1,184.60 |
| Mid-Management Trainee | 749.54 |
| Professional Salesperson | 268.29 |
| Checker/Cashier | 110.78 |
| General Salesperson | 223.74 |

The most expensive job title in the group is Assistant Manager Trainee (Lodging) at $1,482.47. Considering the fact that a Mid-Management Trainee (Marketing) requires an investment of $749.54, or just over half the amount required to produce one Assistant Manager Trainee, this figure seems a bit high.

The costs in Table 3.5 do not reflect the amount spent on quantitative and verbal skill development. These costs were covered in Chapter 2. It is important to note, however, that employers of Marketing graduates especially emphasized the importance of mathematics skills. These students gained on the average of one year in math achievement as measured by the California Test of Basic Skills. Skills gained in the Marketing area alone would not have been sufficient in most instances. Verbal achievement, important to virtually all job titles, also showed marked gains, averaging two years per student (cf. Chapter 2 Foundation Education).

## SUMMATIVE IMPLICATIONS

Inasmuch as roughly half of all students entering Mountain-Plains elect training in either Office Education or Marketing & Tourism, the processes and products of these two areas are extremely important to the effective functioning of Mountain-Plains in general. The performance characteristics of these areas are very similar to those of the entire program, i.e., completion rate is equal to or slightly lower than the program norm, instructional costs are comparable to other program areas, and evaluations by students and employers are as favorable as those for any other program areas.

There are, however, some unique properties of these curriculum areas. A disproportionately high number of spouses and single heads of household elect training in these areas. Many of these women are theoretically misplaced according to test score profiles. However, these women have greater work experience than Mountain-Plains women in general and may very well select traditional roles because they have a better knowledge of the job market than women who chose, for example, carpentry. Other differences include moderately low verbal achievement scores for Food Services students and rather high achievement scores for Marketing students. These differences, however, seem to have no noticeable bearing on outcome variables. Employer evaluations of both groups are fairly similar to those of other exited students. While the greater language facility of Marketing students might have been expected to influence student evaluations of curriculum and staff (in the direction of greater variability in ratings, more intellectualizing in ratings, and greater sensitivity to shortcomings), just the opposite was detected. Not only were curriculum and staff evaluations for Marketing among the best in the program, variability was extremely limited.

Some concerns focus on Lodging. Completion rate (43%) is a program low. Costs are somewhat high in comparison to other areas, e.g., Marketing. Evaluations by students are not good, and employer evaluations were unobtainable. The latter fact is due in part of employment of Lodging completers outside the lodging field. Some reshaping of the area appears necessary. Its job titles appear to be compatible with others in Marketing and Office Education, and assumption of portions of Lodging by these two areas might prove helpful.

In terms of the program's mission to develop, implement, and document, Office Education may be viewed as a model of efficiency. Of all Mountain-Plains components, Office Education seems to have adhered most closely to its original design, has evolved in a systematic fashion, and has responded to factual information concerning its performance.

The four curriculum areas focused upon in this report may be generally regarded as having fulfilled the NIE developmental requirement. Functioning in an efficient and consistent fashion, they are generally quite cost effective. Seven of every ten students entering complete and are employable at entry levels of specialized industries. This task is accomplished with a relatively small staff (six instructors for over 150 students) and within reasonable cost parameters. Efforts at improvement should focus on Lodging. With its limited output (six completers during the period under study as opposed to seventy for Office Education), it might be well to make it a part of Marketing or allow Office Education to assume total responsibility for such job titles as Desk Clerk. In general, however, the overwhelming implication of one year of research on this portion of the Mountain-Plains program is that it is functioning at a very high and stabilized level.

# CHAPTER 4
# BUILDING TRADES

The present report focuses on the ten curriculum areas and various job titles collectively referred to as Building Trades. The objectives, processes, student characteristics, tests, student and employer evaluations and changes are examined, and conclusions are drawn concerning the summative implications for the five year period of research and development of the area.

## OBJECTIVES AND PROCESSES

Building Trades curriculum objectives are generally concentrated in the Knowledge and Application levels of Bloom's taxonomy (72.5% of all objectives are classified as Level 1 or Level 3). However, there are relatively far more Synthesis (Level 5) and Evaluation (Level 6) objectives than in the curricula of other program components. The process implication is that students first acquire knowledge pertaining to a particular tool, procedure, fact, etc. and then apply their knowledge. In many instances, this directed application is reinforced by allowing the student to lay out or plan a piece of work and carry it out, evaluating the results in terms of trade standards, building codes, or other criteria. The process is, therefore, such that the student acquires fairly complex technical skills in a relatively short period of time.

The time factor is a fair indicator of adherence to the instructional process just described. In general, Building Trades students master all curriculum objectives within the time parameters set. These parameters are based on the amounts of time required by previous students and measured skills of present students. Although these times vary greatly from student to student, observed time averages are fairly close to estimated averages or below them (e.g., the mean estimated time requirement for Electrical Wiring was 515.0 hours with a standard deviation of 124.0 hours; actual mean time required was 424.3 hours with a standard deviation of 148.7 hours). A major exception to this rule is Carpentry. Carpentry students typically take about 70% more time than estimated to complete (508.8 hours actually attended vs. 300.3 hours estimated). A closer investigation of student work plans (SWPs) indicated that instructional processes were not being adhered to in Carpentry. While the process developed was an orderly and logical one, the process used was haphazard and dictated by degree of completion of a particular project and by available materials rather than the curriculum objectives. Other areas appear to have followed program design rather well.

## STUDENT CHARACTERISTICS

As pointed out in Volume I, Building Trades students are fairly typical of Mountain-Plains student families. They are, however, slightly younger and have more debts than most student families.

In terms of vocational aptitude, interest, and value profiles, Building Trades was dominated by male Subgroup 4 and, to a lesser extent, Subgroup 3. The common characteristic of these two groups was the fact that Building Trades seemed inappropriate as a career choice (cf. Bunch, Conrad, Lewis, & Manley, 1976). Subgroup 3 men, for example, had an intense lack of interest in skilled crafts. Subgroup 4 men had extremely high business interests and very low affinity for accomplishment and activity. These strange combinations of vocational characteristics should have vitiated students' chances for completion but did not. The best possible explanation of the apparent discrepancy is that these men will probably make good shop stewards.

## TEST RELIABILITY AND VALIDITY

Twelve course tests and 31 unit tests were considered in reliability and validity estimates. Electronic Assembly (CA 71) and Heating Systems (CA 74) were not represented. Appliance Service (CA 76) and Radio & TV Repair (CA 77) were relatively over-represented, accounting for about half of all tests (six course tests and fifteen unit tests).

Reliability results. The ability of specific course and unit test items to discriminate between masters and non-masters is described in Tables 4.1 and 4.2.

Table 4.1
Course Test Reliability by Course

| Course | Items with $\phi \geq .30$ | | Total Items |
|---|---|---|---|
| | n | % | |
| Rough-In (Carpentry) | 96 | 31.0 | 310 |
| Electrical Wiring Rough-In | 85 | 58.6 | 145 |
| Drainage & Vent Systems (Plumbing) | 18 | 12.9 | 140 |
| Supply Piping Systems (Plumbing) | 27 | 13.9 | 195 |
| Heater Type Appliances | 0 | 0.0 | 145 |
| Motor Operated Appliances | 0 | 0.0 | 200 |
| D.C. Circuits (Radio & TV Repair) | 0 | 0.0 | 190 |
| A.C. Circuits (Radio & TV Repair) | 31 | 23.9 | 130 |
| Basic Radio Theory | 40 | 21.6 | 185 |
| Television Repair | 135 | 24.3 | 555 |
| Electric Motor Repair | 0 | 0.0 | 220 |
| Basic Drawing (Drafting) | 39 | 30.0 | 130 |
| TOTAL | 471 | 18.5 | 2,545 |

Table 4.2
Unit Test Reliability by Unit

| Unit | Items with $\phi \geq .30$ | | Total Items |
|---|---|---|---|
| | n | % | |
| Excavation Layout-Concrete and Forms | 39 | 30.0 | 130 |
| Floor and Wall Framing | 41 | 48.2 | 85 |
| Ceiling Framing | 0 | 0.0 | 35 |
| Machine Processes | 22 | 40.0 | 55 |
| Exterior Wall Coverings and Cornice | 0 | 0.0 | 30 |

| | | | |
|---|---|---|---|
| Windows and Trim | 18 | 76.0 | 25 |
| Interior Coverings | 0 | 0.0 | 50 |
| Subtotal for Carpentry | 120 | 26.1 | 410 |
| Outlet & Switch Boxes | 14 | 28.0 | 50 |
| Subtotal for Electrical Wiring | 14 | 28.0 | 50 |
| Pipe and Fittings Assembly | 34 | 45.3 | 75 |
| Pipe and Fittings | 6 | 24.0 | 25 |
| Cold Water Supply | 32 | 53.3 | 60 |
| Fixtures | 0 | 0.0 | 70 |
| Subtotal for Plumbing | 72 | 31.3 | 230 |
| Refrigeration Systems | 0 | 0.0 | 10 |
| Evacuating, Charging and Leak Testing Refrigeration Systems | 8 | 53.3 | 15 |
| Fundamentals of Refrigeration and Controls | 14 | 56.0 | 25 |
| Subtotal for Refrigeration/ Cooling | 22 | 44.0 | 50 |
| Irons | 18 | 72.0 | 25 |
| Roasters | 13 | 65.0 | 20 |
| Space Heaters | 7 | 35.0 | 20 |
| Water Heaters | 29 | 72.5 | 40 |
| Electric Ranges | 11 | 55.0 | 20 |
| Gas Ranges | 16 | 80.0 | 20 |
| Mixers and Blenders | 23 | 57.5 | 40 |
| Vacuum Cleaners and Floor Polishers | 24 | 60.0 | 40 |
| Washing Machines | 13 | 65.0 | 20 |
| Clothes Dryers | 27 | 67.5 | 40 |
| Dishwashers | 14 | 70.0 | 20 |
| Compactor | 12 | 60.0 | 20 |
| Subtotal for Appliance Service | 207 | 63.7 | 325 |
| Introduction to Radio | 15 | 75.0 | 20 |
| Crystal Detectors | 30 | 75.0 | 40 |
| Regenerative Receivers | 26 | 86.7 | 30 |
| Subtotal for Radio & TV Repair | 71 | 78.9 | 90 |
| TOTAL | 506 | 42.0 | 1,155 |

As Tables 4.1 and 4.2 indicate, unit tests tend to be more reliable than course tests. This phenomenon is typical of practically all Mountain-Plains curriculum areas. It is somewhat inexplicable inasmuch as unit and course tests draw from a common item pool. Testing conditions, however, vary. Unit tests are given at a time closer to the actual acquisition of a skill or bit of knowledge and may therefore be considered more likely to reflect individual differences in mastery (i.e. masters from non-masters).

Validity results. Most Building Trades units possess performance tests. Therefore, it is possible to assess two types of validity, content validity (Dpp) and concurrent validity. In general the contingency relationship between unit cognitive and performance tests was very poor. Median phi value was .00, or absolute statistical independence. Only Appliance Service had unit tests of respectable validity (median $\phi = .32$). Dpp values of course tests are given in Table 4.3.

Table 4.3
Course Test Validity by Course

| | Items with Dpp ≥ 30% | | |
|---|---|---|---|
| Course | n | % | Total Items |
| Rough-In (Carpentry) | 80 | 25.8 | 310 |
| Electrical Wiring Rough-In | 104 | 71.7 | 145 |
| Drainage & Vent Systems (Plumbing) | 89 | 63.6 | 140 |
| Supply Piping Systems (Plumbing) | 129 | 66.2 | 195 |
| Heater Type Appliances | 64 | 44.1 | 145 |
| Motor Operated Appliances | 70 | 34.0 | 200 |
| D.C. Circuits (Radio & TV Repair) | 93 | 49.0 | 190 |
| A.C. Circuits (Radio & TV Repair) | 44 | 33.9 | 130 |
| Basic Radio Theory | 102 | 55.1 | 185 |
| Television Repair | 427 | 76.9 | 555 |
| Electric Motor Repair | 104 | 47.3 | 220 |
| Basic Drawing (Drafting) | 61 | 46.9 | 130 |
| TOTAL | 1,367 | 53.7 | 2,545 |

Course tests may thus be regarded as fairly sensitive to the objectives of instruction. Just over half (53.7%) reflect pre - post gains in probability of a student answering the item correctly. As pointed out previously, Building Trades test items (both unit and course) are perhaps more difficult than necessary.[1] This fact would account for the relatively large Dpp values (very few students should answer the items correctly on pretest, but post test probability is slightly lower than desired) and the lack of relationship between unit cognitive and performance tests (in many instances, every student passed the performance test while failing the cognitive test, indicating that the cognitive test was too difficult).

## STUDENT EVALUATIONS

Curriculum. Seven curriculum areas were evaluated by 28 students. Only one of these curriculum areas, Radio & TV Repair, received enough evaluations (17) to allow for reliable interpretation. Therefore all results are presented as if Building Trades were a unitary curriculum area. Scale score means reflected generally very favorable student responses. Means were 19.1 (S.D.=7.4) for Scale 1 and 17.4 (S.D.=7.8) for Scale 2. Confidence intervals were 16.4-21.9 for Scale 1 and 14.5-20.3 for Scale 2. Thus, it may be safely concluded that not only did students like the Building Trades curriculum materials and procedures, but that they also found them relevant.

In comparison to other program areas, Building Trades was very favorably perceived by students. About average in terms of Affect (ranked fifth out of ten areas), Building Trades curriculum ranked third (behind Health Education and Office Education) in Relevance (Scale 2) and received significantly better ratings than Consumer Education, Marketing & Tourism, Communication Skills, and Mobility & Transportation.

Instructors. Seven instructors were evaluated by 55 students. Overall scale score means were very favorable, 17.4 (S.D.=8.7) for Scale 1 and 16.3 (S.D.= 7.2) for Scale 2. Confidence intervals were 15.1-19.7 for Scale 1 and 14.4-

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[1] M.B. Bunch, Reliability/Validity assessment of Mountain-Plains tests. Glasgow, MT: Mountain-Plains Press, 1976.

18.2 for Scale 2. Not only do scale intervals not include any value above 30, they contain no value above 20. Thus, one may conclude with near certainty that students in the Building Trades curriculum areas got along very well with their instructors and found them to be extremely competent. Analysis of variance revealed no significant differences among the Building Trades staff on either scale.

Compared to other program areas, however, there were major differences. While Building Trades instructors were perceived as about average in terms of rapport (on Scale 1, they ranked fifth out of ten areas), they were collectively perceived as significantly more competent than instructors in six other curriculum areas, Home Management, Parent Involvement, Mathematics Skills, Consumer Education, Mobility & Transportation, and Communication Skills.

## EMPLOYER EVALUATIONS

Thirty employer evaluations, representing Carpentry, Electrical Wiring, Plumbing, Heating Systems, Refrigeration/Cooling, Appliance Service, Radio & TV Repair, and Drafting, were received. No major deficiencies in either technical skills or employability traits were noted. Only 18.2% of all skill ratings were unsatisfactory, and only 13.5% of all employability ratings were in this category. Conversely, 71.8% of skill ratings and 86.5% of employability ratings were satisfactory or better. In fact, nearly half (49.5%) of all employability ratings were above average or superior.

Some problems surfaced in relation to the job relatedness of some training. Plumbers and Electrical Wiremen in particular seemed to be inappropriately employed, i.e., working in their respective areas but performing fairly menial tasks. The resultant employer evaluations indicated that several skills acquired at Mountain-Plains were either unnecessary or unobserved. While this finding has implications for training, its major implication appears to be relevant to placement.

Radio & TV Repair students received a number of unsatisfactory ratings in a single skill category. The relatively high frequency of unsatisfactory ratings (27.8%) for this group was due almost entirely to lack of troubleshooting skills. Employers' major complaint was that Mountain-Plains trained employees were unable to take a malfunctioning set, diagnose the problem, and repair it. In many instances diagnosis consisted of applying a standardized set of procedures or using a checklist.

Viewed collectively, employer evaluations of exited Building Trades students were very favorable. Employers endorsed both the skills and employability traits of students. In a comparative sense, Building Trades neither excelled nor lagged behind any other program component. Employer evaluations of students trained in the area were very similar to those of students trained in other program areas, i.e., very good.

## CHANGE ANALYSIS

The most dramatic implied change in Building Trades is the fact that nearly four out of five students entering the area ultimately complete. In other words, the change of state from non-master to master of a particular job title is effected for 78.3% of all Building Trades students. Considering the fact that most Building Trades curriculum is more complex (i.e., has higher level objectives) and generally more difficult than most other curricula, this is a very encouraging finding. It is even more encouraging in light of the fact that most of the students entering the area appear to possess aptitudes, interests, and work values more suited to other areas. In fact, a substantial minority of Building Trades students possess characteristics that suggest training in nearly any field except Building Trades.

The costs involved in brining about these changes in proficiency and employability were, with one exception, typically within reason. Table 4.4 gives a summary by job title of costs.

Table 4.4
Cost by Job Title

| Job Title | Cost Per Completer |
|---|---|
| Carpenter | $2,984.72 |
| Electrical Wireman | 577.05 |
| Plumber | 2,990.41 |
| Heating Systems Serviceman | 5,213,73 |
| Refrigeration/Cooling Systems Serviceman | 3,170.23 |
| Radio & TV Repair | 789.26 |
| Electric Motor Repairman | 3,051.23 |
| Draftsman | 1,074.89 |

## SUMMATIVE IMPLICATIONS

With some exceptions, the processes and products of Building Trades, developed over a period of nearly four years and evaluated under conditions of stability for another year, are sound. The system of instruction, consisting of individualized curriculum packages and corresponding tests, has some defects. These are primarily deficiencies in course tests. The only curriculum deficiencies relate to failure in a few areas to captialize on multiple learning strategies and the apparent failure of one area to train students in troubleshooting.

Because of its high completion rate, Building Trades has been extremely cost effective. Of the $154,418.23 spent for training in the areas, $142,505.07, or 92.3%, was spent on students who actually completed all requirements for some job title. The only questionable job title was Heating Systems Serviceman. The cost of producing a completer in this particular job title was about

75% higher than the next most expensive job title and at least twice as much as the typical extended job title (e.g. General Mechanic). Carpentry might also have reduced its cost by focusing on the excessive amount of time required to master all objectives. Costs might have been reduced by as much as $1,000 had the instructional process been adhered to more faithfully.

It is with respect to this latter point that the major negative finding of Building Trades is brought to light. Carpentry students apparently spent many hours in non-instructional endeavors. Evaluation of the area is then reduced from evaluation of the system or design developed to assessment of the degree to which the design was followed. Employer evaluations were too few to provide a thorough evaluation of the ad hoc system of instruction in the Carpentry area.

With this exception and with the exception of the apparent neglect of troubleshooting practice in Radio & TV Repair, Building Trades design is an excellent one, well thought of by employers and effectively negotiated by students. The troubleshooting problems have received attention, and efforts are currently under way to correct the situation.

# CHAPTER 5
# MOBILITY & TRANSPORTATION

Mobility & Transportation, comprised of the three curriculum areas Welding Support (CA 36), Automotive (CA 37), and Small Engines (CA 38), is the object of this report. Final evaluation of this program component takes into consideration all external and internal evaluations received to date as well as an assessment of the quality of the instructional system developed.

## OBJECTIVES AND PROCESSES

The great majority (92.2%) of all Mobility & Transportation curriculum unit objectives were either Level 1 (Knowledge) or Level 3 (Application). There appears to be no real, ordered process by which students achieve the goals of the area. Nominally higher order objectives (i.e., course objectives) are generally no more comprehensive or complex than unit objectives. In some instances, unit objectives are actually of a higher order than course objectives. Thus a student is required to master the complex in order to master the simple. Whereas this criticism may not be appropriate where content varies (e.g., it might be logical to expect a student to be able to synthesize fairly complex principles in algebra before being able to comprehend fairly simple calculus concepts), it is especially appropriate here because there is little content variation.

## STUDENT CHARACTERISTICS

As noted in Volume I Chapter 5, Mobility & Transportation students are somewhat younger than Mountain-Plains students in general, demonstrate lower levels of academic achievement, and tend to have had higher pre-center incomes. In terms of subgroup membership, Mobility & Transportation occupations were selected by a disproportionately high number of Group 1 and Group 2 men. The area was not considered appropriate for either group.

Group 1 men are typically program misfits. Their aptitudes/interests/values profiles do not clearly suggest any appropriate area of training available at Mountain-Plains. Dominant interests include culture and technology with a strong affinity for productivity. Dexterity, a prerequisite for all mechanical occupations, is not a dominant feature of the group, they tend to be about average with respect to this factor.

Group 2 men are predicted to do well in office occupations or as salesmen. They have a pronounced dislike for technology and are extremely interested in cultural events and business. They value independence and varied activity.

Given the characteristics of these two groups, it is puzzling that they would end up in an Automotive or Small Engines job title. The presence of Group 1 men in the area may be explained by the fact that no other program area could be considered any more appropriate. Group 2, however, did seem to have a clear choice. It is interesting to note that the only members of Group 2 who did not complete the program were those who selected a job title in Mobility & Transportation.

## TEST RELIABILITY AND VALIDITY

No course tests were available at the time of analysis. The reason for this omission was that it was found that no student had scored at the mastery level. Therefore, it was impossible to conduct item analysis in terms of masters and non-masters. No tests were available for CA 38; however, results from 52 unit tests from CA 36 and 37 were available for analysis. Reliability results are summarized in Table 5.1.

## Table 5.1
## Unit Test Reliability by Unit

| Unit | Items with $\phi \geq .30$ |  | Total Items |
|---|---|---|---|
|  | n | % |  |
| Safety | 7 | 70.0 | 10 |
| Bottle and Regulator and Operation Construction | 3 | 30.0 | 10 |
| Oxygen-Acetylene Welding | 11 | 44.0 | 25 |
| Fundamentals of Arc Welding | 5 | 12.5 | 40 |
| Subtotal for Welding | 26 | 30.6 | 85 |
|  |  |  |  |
| Shop Safety | 7 | 46.7 | 15 |
| Basic Tools | 7 | 70.0 | 10 |
| Special Tools | 5 | 33.3 | 15 |
| Shop Equipment | 10 | 66.7 | 15 |
| Fundamentals of Brake Systems | 0 | 0.0 | 10 |
| Master Cylinder | 4 | 26.7 | 15 |
| Drum Brakes | 9 | 45.0 | 20 |
| Disc Brakes | 6 | 40.0 | 15 |
| Power Brakes | 8 | 80.0 | 10 |
| Emergency Brakes | 4 | 40.0 | 10 |
| Fundamentals of Suspension | 6 | 60.0 | 10 |
| Tire Balancing | 11 | 44.0 | 25 |
| Front-End Alignment | 9 | 45.0 | 20 |
| Fundamentals of Electrical Systems | 6 | 60.0 | 10 |
| Battery Servicing | 10 | 66.7 | 15 |
| Starting System | 11 | 44.0 | 20 |
| Charging Systems | 22 | 55.0 | 40 |
| Ignition Systems | 8 | 80.0 | 10 |
| Lighting Systems | 6 | 40.0 | 15 |
| Fundamentals of Fuel Systems | 0 | 0.0 | 10 |
| Fuel Pumps | 11 | 73.3 | 15 |
| Fuel Lines and Filters | 5 | 50.0 | 10 |
| Fuel Characteristics | 5 | 50.0 | 10 |
| Automatic Chokes | 6 | 60.0 | 10 |
| Fundamentals of Emission Systems | 9 | 45.0 | 20 |
| Servicing Emission Systems | 19 | 63.3 | 30 |
| Fundamentals of Tune-Up | 5 | 50.0 | 10 |
| Test Engine Condition | 7 | 70.0 | 10 |
| Distributor Repair | 7 | 46.7 | 15 |
| Adjustments and Repairs | 4 | 26.7 | 15 |
| Testing Engine Operation | 8 | 80.0 | 10 |
| Fundamentals of 4-Cycle Engines | 5 | 50.0 | 10 |
| Engine Construction | 6 | 60.0 | 10 |
| Valve Train | 8 | 40.0 | 20 |
| Engine Block | 16 | 53.3 | 30 |
| Lubricating Systems | 6 | 40.0 | 15 |
| Cooling Systems | 26 | 65.0 | 40 |
| Clutches | 20 | 50.0 | 40 |
| Fundamentals of Standard Transmission | 6 | 40.0 | 15 |
| Fundamentals of Automatic Transmission | 12 | 34.3 | 35 |

| | | | |
|---|---|---|---|
| Drive Shafts | 3 | 20.0 | 15 |
| Differentials | 18 | 45.0 | 40 |
| Reference Manuals | 5 | 50.0 | 10 |
| Parts Manual | 5 | 50.0 | 10 |
| Cleaning Parts and Work Area | 16 | 53.3 | 30 |
| Oil Changing | 4 | 40.0 | 10 |
| Lubrication | 6 | 60.0 | 10 |
| Tires | 8 | 53.3 | 15 |
| Minor Body Adjustments | 9 | 45.0 | 20 |
| Subtotal for Automotive | 414 | 49.3 | 840 |
| TOTAL | 440 | 47.6 | 925 |

The overall value of 47.6% indicates that the Mobility & Transportation item pool is generally more useful than those of most program areas in terms of discriminating between masters and non-masters. In addition, unit tests are among the best in the program in terms of external validity. Contingency coefficients computed for cognitive vs. performance tests had a median value of .59. Only one area, Marketing (median = .86), had a higher median phi value. Tests for Mobility & Transportation are thus regarded as extremely good.

## STUDENT EVALUATIONS

Curriculum. Eighteen students evaluated the curriculum of Mobility & Transportation. Score means on both scales were relatively high, indicating fairly strong negative opinion on the part of students. Automotive score means were 26.0 (S.D. = 7.4) on Scale 1 and 25.7 (S.D. = 5.2) on Scale 2. Small Engines means were 24.8 (S.D. = 10.0) for Scale 1 and 25.0 (S.D. = 11.0) for Scale 2. Criterion levels of 30 were exceeded by both curriculum areas on Scale 1 and by Small Engines on Scale 2. Thus, it may be concluded that many students do not like either curriculum area and, many find Small Engines curriculum irrelevant. Automotive curriculum may be considered marginally relevant.

Compared to other program areas, Mobility & Transportation ranks last on each scale. The area was perceived by students as significantly inferior to all nine other areas with respect to both Affect (Scale 1) and Relevance (Scale 2).

*Staff*. Mobility & Transportation staff were evaluated by eleven students. Scale score means were 26.6 (S.D. = 17.7) and 24.3 (S.D. = 14.3) for Scales 1 and 2, respectively. Confidence intervals exceeded 30 for both scales, indicating that students generally found the instructors difficult to relate to and incompetent. In relation to other instructors, Mobility & Transportation instructors were perceived as very poor. They were collectively rated as significantly inferior to eight other areas on Scale 1 and significantly inferior to seven other areas on Scale 2. Rank among all ten program areas evaluated was tenth on Scale 1 and ninth on Scale 2. Thus it may be concluded with some assurance that students found a great deal wrong with the instructors in Mobility & Transportation.

## EMPLOYER EVALUATIONS

Fourteen evaluation forms were returned by employers of exited Mobility & Transportation students. Only one of these was for Small Engines. Ratings for skills required and observed were fair; 76% were satisfactory or better. In addition, 15.5% were above average or superior. Only 24.0% of all skill ratings were unsatisfactory. Approximately 15% (14.6%) of all employability ratings were unsatisfactory.

While the employer evaluations received for Mobility & Transportation students were not quite as favorable as those of other program areas (overall rating of 82.5% satisfactory or better on skills rating and 89.2% on employability traits), they do represent a tremendous improvement over the employability ratings of one year ago and the skill ratings of a year to two years ago. The following comments are typical of those received in 1974 and early 1975:[1]

> "took off on a weekend and took company tools with him - sold the tools to get money to return;" "performance was poor...lacked common sense..." "This man was not worth having."

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[1] R. Pollack, Employer evaluations of completing Mountain-Plains students. Glasgow, MT: Mountain-Plains Press, 1975.

## CHANGE ANALYSIS

Viewing the transition from non-master to master of all objectives of a Mobility & Transportation job title as a basic change indicator, it can be seen that 52.9% of the students in the area were able to effect the necessary changes. This figure is somewhat misleading, however, if one is primarily concerned with either Automotive or Small Engines. In Auoomotive, only 43.6% of all students become masters, whereas in Small Engines, 83.3% of all students emerge as masters of the curriculum. These changes are typically brought about for about $2,000 per student (actual figures were $2,520.17 for General Mechanic, $1,611.96 for Brake & Front End Mechanic, and $1,807.22 for Small Engine Mechanic).

It must also be pointed out that Mobility & Transportation students exited the program more employable than when they entered. Employability in this situation implies much more than technical proficiency. Work attitudes and habits are its defining characteristics. Students in the Automotive and Small Engines areas possess pre-center characteristics which could easily prevent development of positive employability traits. Yet, three months after program exit, they are generally rated by employers as being satisfactory or better with respect to employability. This change is effected not entirely within the curriculum area itself, but by many program staff. This change is most pronounced for Small Engines students.

## SUMMATIVE IMPLICATIONS

Were it not for the attention paid to formative evaluation of many facets of Mobility & Transportation (primarily Automotive), there would be a great many negative findings to explain. During the stability phase of the program, it was discovered that Mobility & Transportation was characterized by poor curriculum, poor instruction, dismal completion rate (except in Small Engines), below norm employer evaluations, and relatively immature students whose occupational profiles strongly suggested their presence would be more appropriate elsewhere. The employer evaluations are at least fair (good in some areas); therefore, the majority of existing problems are internal in nature.

In February, 1976, at a time when only half of all stabilization students had exited the area, a major change was initiated in Automotive. It was discovered that the system apparently designed during the years of research and development had never been implemented.[2] The senior instructor was dismissed, and a new staff was recruited. The parameters of stabilization clearly exceeded, the prime consideration became the salvaging of the Automotive program.

To date, the curriculum has been largely resequenced, but few objectives have changed. The area is monitored more closely. However, it is too early to observe the ultimate effects of the rearrangement; very few evaluations from students or employers are available. Along with the curriculum change came a major test revision; therefore the figures given in Table 5.1 can not be considered as representative of Automotive tests as presently constituted.

In short, there is no fully developed, stabilized, documented Automotive program to report on at this time. The Small Engines program is also under consideration for major revision at this time, largely due to negative student opinion of Small Engines curriculum. Therefore, evaluations of that area contained in this report may soon become obsolete.

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[2] One of the most flagrant abuses of the system was the fact that the average student had started, but failed to complete, 29 units of instruction. Classifying students as masters was guesswork at best.

Responsibility for the current state of Mobility & Transportation component of the program is greatly diffused. Just as many program components can claim credit for the positive changes in employability of area students, so must other program staff share in the blame. Poor career guidance efforts are partly responsible for the often inappropriate and sometimes irresponsible career choices of Mobility & Transportation students (other factors include the limited range of career areas). Poor monitoring by program researchers accounts to some extent for the situation wherein the typical Automotive student had started over half in all job title tasks and completed none. Other shortcomings are shared almost equally by nearly all program staff, whose singular purpose it was to develop, implement, and document a program. In the case of Mobility & Transportation this purpose is only now being actively attended to.

# CHAPTER 6
# SUMMARY

Mountain-Plains curricula are characterized by a bimodal objective system. Of the six possible levels of the Bloom taxonomy, Levels 1 and 3 are most often used. The typical instructional strategy is to acquire knowledge and then to apply it. Little attention is given to comprehension (supposedly a link between knowledge acquisition and application), analysis, synthesis, or evaluation. The curriculum might therefore be expected to enable individuals to enter a particular occupation at an entry level. However, any advancement that requires demonstration of comprehension and originality will be retarded unless the student is capable of mastering such competencies. These competencies are developed, at least in part, by Foundation Education. Many of the verbal and mathematical problems solving skills required for each job title are mastered there.

Students who enter Mountain-Plains often select careers that are apparently inappropriate. It is clear not only that many students select job titles that are incongruent with their occupational aptitudes/interests/values profiles, but that for some students, Mountain-Plains has no appropriate career fields. Given this incongruence, problems were predicted for many individuals and some curriculum areas with large numbers of apparently misplaced individuals. In many instances, these predictions were all too accurate (especially for female students). The fact that many students, expected to have negative experiences, did indeed profit a great deal from occupational preparation suggests either that the occupational preparation at Mountain-Plains is general enough to accomodate all types or that students are adaptable enough to succeed in seemingly inappropriate areas.

Evaluations received from students and employers alike suggest that, in most instances, the program developed and perfected prior to December, 1974 and stabilized at that particular time works. Many parts of that program work extremely well. Only in one instance is it obvious that no workable system has been developed.[1] There are two cases of developed systems not being implemented entirely as designed and one instance of a system developed, implemented, and found wanting.

In the case of Automotive, a program had actually been developed. It had been abused and neglected, however, to the point of nonrecognition. This problem was noted, and corrective action was taken. Similarly, the faults of Family Core Curriculum were acknowledged, and a new program was built around the strengths of the old.

In the case of Carpentry and Communication Skills, minor staff problems were noted. Minor here is a relative term; judging by effect, they are negligible, but judging in terms of internal accountability they are quite serious. Instructors in the two areas apparently disregarded to some extent the instructional systems developed. However, excellent results were noted in each area. Communication Skills students make large verbal skill gains in a short period of time; Carpentry students have a high completion rate and receive fairly good evaluations from their employers.

Exemplary program components include Office Education and Marketing. Not only have outstanding programs been developed in these areas, but implementation has followed design to the last detail. Results from these two areas have been very encouraging. Other program components, except the problem areas discussed previously, may be regarded as good or very good. Mathematics Skills and Building Trades areas in general must be evaluated as very good in terms of the programs developed and the results achieved. Lodging, Food Services, and Small Engines are good components. Their designs are generally sound, requiring only minor modifications to achieve exemplary status.

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[1] The status of the Automotive program, alluded to here, has been documented in Chapter 5. Although it was evident that no system of instruction has been implemented at the start of the stabilization phase, it is now equally evident that one is being perfected.

The occupational preparation components of Mountain-Plains may thus be regarded as having all the qualities of a good model. It is well documented. Those wishing to use the model and demonstrating a genuine desire to follow its design should expect good results. This was the principal finding of trial implementation at various sites throughout the country.[2] It is also the conclusion demanded by the great weight of evidence accumulated at Mountain-Plains.

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[2] R.G. England and M.B. Bunch, Final report on user trial of Mountain-Plains curriculum. Glasgow, MT: Mountain-Plains Press, 1976.

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A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# AN AFFECTIVE EVALUATION REPORT

## EARLY CHILDHOOD EDUCATION REPORT NO. 6

## SUMMATIVE EVALUATION OF EARLY CHILDHOOD

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

284-A

# AN AFFECTIVE EVALUATION REPORT

## EARLY CHILDHOOD REPORT NO. 6

## SUMMATIVE EVALUATION OF EARLY CHILDHOOD

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## INTRODUCTION TO THE AFFECTIVE REPORT SERIES

Mountain-Plains Research is divided into three broad areas with overlap. These areas are: 1) External Evaluation, 2) Instructional/Curriculum Evaluation, and 3) Affective Evaluation. Each of these areas is further subdivided as the logic of the research tasks within each dictates. This document is one report in the series "Affective Evaluation Reports". The six major series of reports in this research area are:

1. Counseling Services Reports
2. Career Guidance Reports
3. Early Childhood Education Reports
4. Parent Involvement Reports
5. Community Development Reports
6. General (Affective) Reports

Individual reports in each series are currently available from, or in the process of being incorporated into, the ERIC system. By the conclusion of the NIE research cycle, Affective Evaluation Reports will number about 100.

Many reports with affective content and importance are not cataloged under any of the affective report series. Reports which are interactive efforts of various research areas are typically produced independently by title, or if extensive, constitute a report series in and of themselves. The Case Studies Reports (25 reports in 3 volumes) are an example of the latter case.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program of research, and requires some indulgence on the part of the reader.

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# SUMMATIVE EVALUATION OF EARLY CHILDHOOD

## INTRODUCTION

### Previous Reports

Five previous reports have examined the Early Childhood Education Program(s) at Mountain-Plains. In the first report Weber and Conrad (1974), four program goals were described along with the measurement for attainment. Goals were to advance the development of children in the program in four areas: 1) Self-Development, 2) Social Development, 3) Psychomotor Development, and 4) Cognitive Development. In the second report, Weber (1974) outlines the program structure and rationale for impacting these goal areas. The third and fifth reports (Conrad, 1975, and Conrad and Wiles, 1976) assessed the impact on goal areas from preliminary data. Perceptual motor development as measured by a modified version of the Purdue Perceptual Motor Survey (Roach and Kephart, 1966) was enhanced with the enhancement centered in body image and form perception. Using the same age-corrected scores and independent samples methodology cognitive improvement was also noted with the Peabody Picture Vocabulary Test (Dunn, 1965); however, no improvement was noted on self or social development as rated on the Child Behavior Rating Scales (Cassell, 1962). Early Childhood Report No. 4 delineated a program aimed at improving both custodial care for, and developmental stimulation of infants in the Mountain-Plains sponsored infant care program (Peterson and Wiles, 1976).

### Final Analysis

The current report attempts to confirm/refute the findings of reports three and five, and to elaborate understanding of program effects to subgroups. By the addition of data from interviews covering all ECE staff, it attempts to resolve grey and/or contradictory findings in the earlier reports.

## METHODOLOGY

Subjects. Subjects are children of Mountain-Plains families who participated in the Early Childhood Education program for 2½ to 6 year olds, and for whom both an entry and an exit test are available for comparison. Families from which children derive are, by definition, disadvantaged in the socio-economic sense. Two-thirds of the families are "poverty" families as per the Office of Economic Opportunity formula. Comprehensive descriptions of the social and psychological character of families/adult family members are available. See Myers and Honrud (1974), Conrad (1974), Conrad and McMahon (1974), and Conrad and Bunch (1976).

Instrument. Portions of two instruments are in use.[1] A modification of the Purdue Perceptual Motor Survey (Roach and Kephart, 1966) by Weber as documented in Conrad and Wiles (1976) is used to analyze perceptual motor development. As the test is used differently from its standard form, reliability and validity data as reported by its authors may not apply. Discriminant validity evidence is available on Weber's scale modification in that it could distinguish between pre and post treatment status of children enrolled in a developmental program (Conrad and Wiles, 1976) on two parts (Body Image and Form Perception) and for the total score ($p \leq .10$).

Cognitive Development is measured with the Peabody Picture Vocabulary Test (Dunn, 1965). Reliabilities range from .76 to .84 depending on the age tested. Validity has been established in numerous studies.

Design. The basic design for the study is a pretest/post test one group study. The analysis of covariance is used to correct for maturation by using age as a covariate. In subgroup comparisons, post tests are compared with pretests also used as a covariate. The design additionally includes a one-hour semistructured interview with each ECE staff member during the month of June, 1976.

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[1] Cassell's (1962) Child Behavior Rating Scales were used in preliminary analyses, but were abandoned due to problems with interrater reliability and lack of criterion validity evidence.

Procedures. During the second week of attendance in the ECE program, children are tested by ECE staff. Post tests are again administered the last week prior to the family departure from the Mountain-Plains Program. As children often depart without notice (enrollment and attendance of children is, procedurely, a service to, rather than a requirement of, parents) post tests on the Peabody and Purdue were not attained in many cases.

Interview methodology was substituted for instrumentation for final analysis of self and social development. During June, 1975, all teachers and aides completed a one-hour semi-structured interview centered on exploring the teacher's development emphasis (cognitive, social, self, psychomotor, or physical) with students and perceived effects; particularly on self and social development. Ten interviews were completed with: 1) The Area Supervisor, 2) Two Aides, 3) The Infant Care Facilitator (who formerly instructed one of the houses, 4) Six Nursery Instructors, and 5) The Kindergarten Instructor.

## RESULTS

Children enrolled in Mountain-Plains ECE improve their cognitive performance; gaining about two months in mental age for every month in program or about 8 "I.Q." points. Sex and age group influenced development with males and older age groups making the greatest gains.

There is no enhancement of development for Balance and Posture. No subgrouping variable influenced score change.

Body Image scores increase. Parent marital status, teacher, and age groups all showed significant influences on development.

Form Perception Scores increase, but are not seen to be differentially influenced by any subgrouping variable.

The Perceptual Motor Total score increases. Development is influenced by teacher and age group.

Early Childhood staff are unanimous in stating that children make strides in their Social Development (interactions with other children and adults) and in their Self-Development (as reflected in self-confidence, positive self statements, and the like). Five of the seven instructors stated that self-development was their primary objective in their work with children (the other two cited cognitive development). However, each teacher reported a percentage of enrolled children who had not shown improvement. From ten to twenty percent of children were so categorized.

## DISCUSSION

Overall results on ECE are quite favorable. Controlling stastically for maturation the cognitive and psychomotor areas show clear gain. The doubling of cognitive development (versus norms) is most impressive; especially as this was a secondary emphasis to self-development for most teachers.

Older children showed the most gains on cognitive variables and younger children the most in the psychomotor area. However, psychomotor development is clearly not a linear phenomena, and the stastical maturation controls were probably inadequate. The cognitive improvements, however, withstand methodology tests in all areas except sampling.

During the interviews, teachers universally complained about class size. Classes averaged ten children, but ranged upward into the teens on occasion.

Instructors reported that there was no time available to work individually with the 10-20% of children who had need of special help and who, without it, departed the program in a similar condition to that in which they entered. "An aide for each house" was a universal plea during interviews.[2]

The major limitation of the study was the large amount of missing data. While entry scores of children departing without post tests did not differ statistically, the trend was to lower entry scores for this group. Current results, while probably generalizable to Mountain-Plains children, are not provably so.

## IMPLICATIONS/RECOMMENDATIONS

1. It is clear that the Mountain-Plains Program with an undesirably high child/teacher ratio had a positive effect on children in general. However, this seems to have been at the expense of those children most in need of developmental attention.
2. In light of No. 1 above, it would seem that programs would be more effective, particularly with the most needing children, if the recommended Federal guideline of a 5:1 ratio were maintained by either adding instructors or providing an aide for instructors who are responsible for more children. The younger the children, the more necessary this would seem.
3. Particularly where children of disadvantaged families are served, staff resources in such areas as child counseling, and speech and learning problems should be provided. Again we cite the interview data that says group mean improvement hides the fact that those whose need is greatest are worst served.

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[2] Another frequent recommendation was availability of specialists in child counseling, speech and learning problems, and the like.

## Table 1

## Score Changes for ECE Quantative Variables

|  |  | Pretest |  | Post Test |  |  |  |
|---|---|---|---|---|---|---|---|
| Variable | N | $\bar{X}$ | SD | $\bar{X}$ | SD | p | From ANCOVA Table |
| Mental Age | 79 | 41.7 | 16.9 | 52.0 | 18.9 | .02 | 3 |
| I.Q. Estimate | 79 | 90.0 | 16.3 | 97.9 | 14.5 | <.01 | (t = 4.84) |
| Balance & Posture | 94 | 15.5 | 9.86 | 19.9 | 8.58 | .16 | 4 |
| Body Image | 94 | 23.1 | 13.0 | 31.5 | 8.98 | <.01 | 5 |
| Ocular Pursuit | 94 | 6.45 | 5.98 | 9.89 | 5.62 | .02 | 6 |
| Form Perception | 94 | 4.27 | 3.09 | 7.69 | 9.31 | .06 | 7 |
| Perception/Motor Total | 94 | 49.1 | 28.6 | 65.7 | 21.1 | .01 | 8 |

Table 2

Differential Development by Subgroup

| | Potential Developmental Influences | | | | | |
|---|---|---|---|---|---|---|
| | Child Sex | Parent Marital | Teacher | Ethnic Group | Family Completion | Age Group |
| Peabody | Yes | No | No | No | No | Yes |
| Balance & Posture | No | No | Yes | No | No | No |
| Body Image | No | Yes | Yes | No | No | Yes |
| Ocular Pursuit | No | No | Yes | No | No | Yes |
| Form Perception | No | No | No | No | No | No |
| Perception/Motor Total | No | No | Yes | No | No | Yes |

## Table 3

## Analysis of Covariance for Peabody Score by Child Sex

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 40.68 | 1 | 40.68 |
| Sex | 191.24 | 1 | 191.24 |
| 1st Covariate: Entry Score | 1,314.79 | 1 | 1,314.79 |
| 2nd Covariate: Age | 903.35 | 1 | 903.35 |
| All Covariates | 11,442.98 | 2 | 5,721.49 |
| Error | 3,267.74 | 75 | 43.57 |

## Table 4

## Analysis of Covariance for Balance and Posture by Sex

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | .89 | 1 | .89 |
| Sex | 1.73 | 1 | 1.73 |
| 1st Covariate: Pretest | 313.93 | 1 | 313.93 |
| 2nd Covariate: Age | 193.90 | 1 | 193.90 |
| All Covariates | 2,247.37 | 2 | 1,123.69 |
| Error | 1,037.67 | 43 | 24.13 |

## Table 5

### Analysis of Covariance for Body Image by Child Sex

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 258.42 | 1 | 258.42 |
| Sex | 85.68 | 1 | 85.68 |
| 1st Covariate: Pretest | 281.39 | 1 | 281.39 |
| 2nd Covariate: Age | 300.20 | 1 | 300.20 |
| All Covariates | 2,264.55 | 2 | 1,132.28 |
| Error | 1,439.31 | 43 | 33.47 |

## Table 6

### Analysis of Covariance for Ocular Pursuit by Child Sex

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 182.31 | 1 | 182.31 |
| Sex | 8.72 | 1 | 8.72 |
| 1st Covariate: Pretest | 24.97 | 1 | 24.97 |
| 2nd Covariate: Age | 1.44 | 1 | 1.44 |
| All Covariates | 43.38 | 2 | 21.69 |
| Error | 1,406.23 | 43 | 32.70 |

## Table 7

## Analysis of Covariance for Form Perception by Child Sex

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 40.13 | 1 | 40.13 |
| Sex | 7.98 | 1 | 7.98 |
| 1st Covariate: Pretest | 295.39 | 1 | 295.39 |
| 2nd Covariate: Age | 501.84 | 1 | 501.84 |
| All Covariates | 520.87 | 2 | 260.43 |
| Error | 3,487.76 | 44 | 79.27 |

## Table 8

## Analysis of Covariance for Balance and Posture Total: Sex by Pretest by Age

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 1,458.61 | 1 | 1,458.61 |
| Sex | 333.32 | 1 | 333.32 |
| 1st Covariate: Pretest | 2,029.29 | 1 | 2,029.29 |
| 2nd Covariate: Age | 653.40 | 1 | 653.40 |
| All Covariates | 11,308.45 | 2 | 5,654.22 |
| Error | 9,660.41 | 44 | 219.55 |

## Table 9

## Analysis of Covariance for Peabody Raw Scores by Family Completion

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 3.25 | 1 | 3.25 |
| Completion | 165.67 | 2 | 82.84 |
| 1st Covariate: Pretest | 637.64 | 1 | 637.64 |
| 2nd Covariate: Age | 640.00 | 1 | 640.00 |
| All Covariates | 7,510.23 | 2 | 3,755.12 |
| Error | 1,326.01 | 38 | 34.89 |

## Table 10

## Analysis of Covariance for Balance & Posture by Family Completion

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 2.37 | 1 | 2.27 |
| Completion | 1.79 | 2 | .90 |
| 1st Covariate: Pretest | 161.35 | 1 | 161.35 |
| 2nd Covariate: Age | 8.32 | 1 | 8.32 |
| All Covariates | 1,347.44 | 2 | 673.72 |
| Error | 169.86 | 12 | 14.15 |

### Table 11

### Analysis of Covariance for Body Image by Family Completion

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | .23 | 1 | .23 |
| Completion | 14.85 | 2 | 7.43 |
| 1st Covariate: Pretest | 2.96 | 1 | 2.96 |
| 2nd Covariate: Age | 153.26 | 1 | 153.26 |
| All Covariates | 1,556.54 | 2 | 778.27 |
| Error | 331.80 | 12 | 27.65 |

### Table 12

### Analysis of Covariance for Ocular Pursuit by Family Completion

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 65.37 | 1 | 65.37 |
| Completion | 29.62 | 2 | 14.81 |
| 1st Covariate: Pretest | .72 | 1 | .72 |
| 2nd Covariate: Age | 169.39 | 1 | 169.39 |
| All Covariates | 405.15 | 2 | 202.58 |
| Error | 213.06 | 12 | 17.75 |

## Table 13

### Analysis of Covariance for Form Perception by Family Completion

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 11.33 | 1 | 11.33 |
| Completion | 15.05 | 2 | 7.53 |
| 1st Covariance: Pretest | 3.67 | 1 | 3.67 |
| 2nd Covariance: Age | .02 | 1 | .02 |
| All Covariates | 16.96 | 2 | 8.48 |
| Error | 50.63 | 13 | 3.89 |

## Table 14

### Analysis of Covariance for Perceptual Motor Total

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 212.58 | 1 | 212.58 |
| Completion | 118.32 | 2 | 59.16 |
| 1st Covariance: Pretest | 12.95 | 1 | 12.95 |
| 2nd Covariance: Age | 968.14 | 1 | 968.14 |
| All Covariates. | 11,422.56 | 2 | 5,711.28 |
| Error | 3,357.73 | 13 | 258.29 |

## Table 15

Analysis of Covariance for Mental Age by Age Groups

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 2,716.21 | 1 | 2,716.21 |
| Age Group | 1,981.68 | 3 | 660.56 |
| 1st Covariance: Pretest | 2,810.30 | 1 | 2,810.30 |
| Error | 5,812.48 | 74 | 78.55 |

## Table 16

Analysis of Covariance for Balance & Posture by Age Groups

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 1,167.67 | 1 | 1,167.67 |
| Age Group | 145.20 | 3 | 48.40 |
| 1st Covariance: Pretest | 243.66 | 1 | 243.66 |
| Error | 1,219.11 | 43 | 28.35 |

## Table 17

### Analysis of Covariance for Body Image by Age Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 4,042.10 | 1 | 4,042.10 |
| Age Group | 620.62 | 3 | 206.87 |
| 1st Covariate: Pretest | 168.14 | 1 | 168.14 |
| Error | 1,499.39 | 43 | 34.87 |

## Table 18

### Analysis of Covariance for Ocular Pursuit by Age Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 1,420.11 | 1 | 1,420.11 |
| Age Group | 300.71 | 3 | 100.24 |
| 1st Covariate: Pretest | 22.47 | 1 | 22.47 |
| Error | 1,115.24 | 43 | 25.94 |

## Table 19

## Analysis of Covariance for Form Perception by Age Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 1,366.33 | 1 | 1,366.33 |
| Age Group | 416.38 | 3 | 138.79 |
| 1st Covariate: Pretest | 238.15 | 1 | 238.15 |
| Error | 3,647.96 | 44 | 82.91 |

## Table 20

## Analysis of Covariance for Perceptual Motor Total by Age Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 14,768.52 | 1 | 14,768.52 |
| Age Group | 1,657.46 | 3 | 552.49 |
| 1st Covariate: Pretest | 1,380.25 | 1 | 1,380.25 |
| Error | 8,820.92 | 44 | 200.48 |

## Table 21

## Analysis of Covariance for Peabody Raw Score by Ethnic Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 26.82 | 1 | 26.82 |
| Ethnic Group | 112.41 | 2 | 56.20 |
| 1st Covariate: Pretest | 1,087.29 | 1 | 1,087.29 |
| 2nd Covariate: Age | 892.68 | 1 | 892.68 |
| All Covariates | 9,998.32 | 2 | 4,999.16 |
| Error | 3,329.60 | 71 | 46.90 |

## Table 22

## Analysis of Covariance for Balance & Posture by Ethnic Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | .68 | 1 | .68 |
| Ethnic Group | 77.89 | 2 | 38.94 |
| 1st Covariate: Pretest | 225.33 | 1 | 225.33 |
| 2nd Covariate: Age | 265.09 | 1 | 265.09 |
| All Covariates | 2,416.54 | 2 | 1,208.27 |
| Error | 929.25 | 41 | 22.66 |

## Table 23

### Analysis of Covariance for Body Image by Ethnic Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 352.60 | 1 | 352.60 |
| Ethnic Group | 113.25 | 2 | 56.62 |
| 1st Covariate: Pretest | 409.95 | 1 | 409.95 |
| 2nd Covariate: Age | 283.50 | 1 | 283.50 |
| All Covariates | 2,444.74 | 2 | 1,222.37 |
| Error | 1,160.04 | 41 | 28.29 |

## Table 24

### Analysis of Covariance for Ocular Pursuit by Ethnic Group

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 192.42 | 1 | 192.42 |
| Ethnic Group | 4.31 | 2 | 2.16 |
| 1st Covariate: Pretest | 28.59 | 1 | 28.59 |
| 2nd Covariate: Age | 1.31 | 1 | 1.31 |
| All Covariates | 46.94 | 2 | 23.47 |
| Error | 1,402.89 | 41 | 34.22 |

## Table 25

### Analysis of Covariance for Form Perception by Ethnic Group

| Source | SS | DF | MS |
|---|---:|---:|---:|
| Mean | 52.33 | 1 | 52.33 |
| Ethnic Group | 6.32 | 2 | 3.16 |
| 1st Covariate: Pretest | 307.75 | 1 | 307.75 |
| 2nd Covariate: Age | 542.48 | 1 | 542.48 |
| All Covariates | 563.51 | 2 | 281.75 |
| Error | 3,489.41 | 42 | 83.08 |

## Table 26

### Analysis of Covariance for Perceptual Motor Total by Ethnic Group

| Source | SS | DF | MS |
|---|---:|---:|---:|
| Mean | 1,926.77 | 1 | 1,926.77 |
| Ethnic Group | 654.25 | 2 | 327.12 |
| 1st Covariate: Pretest | 2,366.32 | 1 | 2,366.32 |
| 2nd Covariate: Age | 609.74 | 1 | 609.74 |
| All Covariates | 12,178.60 | 2 | 6,089.30 |
| Error | 8,559.98 | 42 | 203.81 |

## Table 27

## Analysis of Covariance for Peabody Raw Scores by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | .21 | 1 | .21 |
| Teacher | 600.61 | 11 | 54.60 |
| 1st Covariate: Pretest | 970.47 | 1 | 970.47 |
| 2nd Covariate: Age | 593.28 | 1 | 593.28 |
| All Covariates | 2,863.43 | 2 | 1,431.71 |
| Error | 2,818.11 | 64 | 44.03 |

## Table 28

## Analysis of Covariance for Balance & Posture by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | .69 | 1 | .69 |
| Teacher | 221.97 | 11 | 20.18 |
| 1st Covariate: Pretest | 146.41 | 1 | 146.41 |
| 2nd Covariate: Age | 49.96 | 1 | 49.96 |
| All Covariates | 260.59 | 2 | 130.29 |
| Error | 817.43 | 33 | 24.77 |

## Table 29

### Analysis of Covariance for Body Image by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 418.91 | 1 | 418.91 |
| Teacher | 934.10 | 11 | 84.92 |
| 1st Covariate: Pretest | 94.58 | 1 | 94.58 |
| 2nd Covariate: Age | 54.27 | 1 | 54.27 |
| All Covariates | 120.64 | 2 | 60.32 |
| Error | 590.89 | 33 | 17.91 |

## Table 30

### Analysis of Covariance for Ocular Pursuit by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 2.50 | 1 | 2.50 |
| Teacher | 563.09 | 11 | 51.19 |
| 1st Covariate: Pretest | 6.70 | 1 | 6.70 |
| 2nd Covariate: Age | 9.03 | 1 | 9.03 |
| All Covariates | 15.16 | 2 | 7.58 |
| Error | 851.86 | 33 | 25.81 |

### Table 31

### Analysis of Covariance for Form Perception by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 10.56 | 1 | 10.56 |
| Teacher | 554.36 | 12 | 46.20 |
| 1st Covariate: Pretest | 418.75 | 1 | 418.75 |
| 2nd Covariate: Age | 12.11 | 1 | 12.11 |
| All Covariates | 420.95 | 2 | 210.47 |
| Error | 2,941.37 | 33 | 89.13 |

### Table 32

### Analysis of Covariance for Perceptual/Motor Total by Teacher

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 462.06 | 1 | 462.06 |
| Teacher | 5,917.45 | 12 | 493.12 |
| 1st Covariate: Pretest | 491.62 | 1 | 491.62 |
| 2nd Covariate: Age | 13.51 | 1 | 13.51 |
| All Covariates | 573.53 | 2 | 286.76 |
| Error | 4,076.28 | 33 | 123.52 |

## Table 33

## Analysis of Covariance for Peabody Raw Score by Parent Marital Status

| Source | SS | DF | MS |
|---|---:|---:|---:|
| Mean | 67.59 | 1 | 67.59 |
| Marital Status | 11.10 | 1 | 11.10 |
| 1st Covariate: Pretest | 1,376.58 | 1 | 1,376.58 |
| 2nd Covariate: Age | 770.12 | 1 | 770.12 |
| All Covariates | 11,177.18 | 2 | 5,588.59 |
| Error | 3,447.88 | 75 | 45.97 |

## Table 34

## Analysis of Covariance for Balance and Posture by Parent Marital Status Controlling for Pretest and Age

| Source | SS | DF | MS |
|---|---:|---:|---:|
| Mean | 2.59 | 1 | 2.59 |
| Marital Status | 35.31 | 1 | 35.31 |
| 1st Covariate: Pretest | 346.98 | 1 | 346.98 |
| 2nd Covariate: Age | 162.99 | 1 | 162.99 |
| All Covariates | 2,381.75 | 2 | 1,190.88 |
| Error | 1,004.09 | 43 | 23.35 |

## Table 35

## Analysis of Covariance for Body Image by Parent Marital Status

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 401.80 | 1 | 401.80 |
| Marital Status | 117.95 | 1 | 117.95 |
| 1st Covariate: Pretest | 450.09 | 1 | 450.09 |
| 2nd Covariate: Age | 181.33 | 1 | 181.33 |
| All Covariates | 2,282.03 | 2 | 1,141.02 |
| Error | 1,407.04 | 43 | 32.72 |

## Table 36

## Analysis of Covariance for Ocular Pursuit by Marital Status

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 212.97 | 1 | 212.97 |
| Marital Status | 8.18 | 1 | 8.18 |
| 1st Covariate: Pretest | 23.87 | 1 | 28.87 |
| 2nd Covariate: Age | .23 | 1 | .23 |
| All Covariates | 42.51 | 2 | 21.25 |
| Error | 1,406.76 | 43 | 32.72 |

## Table 37

## Analysis of Covariance for Form Perception by Marital Status

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 66.41 | 1 | 66.41 |
| Marital Status | 86.03 | 1 | 86.03 |
| 1st Covariate: Pretest | 328.84 | 1 | 328.84 |
| 2nd Covariate: Age | 600.85 | 1 | 600.85 |
| All Covariates | 616.05 | 2 | 308.02 |
| Error | 3,409.71 | 44 | 77.49 |

## Table 38

## Analysis of Covariance for Perceptual Motor Total by Parent Marital Status

| Source | SS | DF | MS |
|---|---|---|---|
| Mean | 2,017.08 | 1 | 2,017.08 |
| Marital Status | 329.24 | 1 | 329.24 |
| 1st Covariate: Pretest | 2,567.83 | 1 | 2,567.83 |
| 2nd Covariate: Age | 361.95 | 1 | 361.95 |
| All Covariates | 11,301.04 | 2 | 5,650.52 |
| Error | 9,664.49 | 44 | 219.65 |

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A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# AFFECTIVE EVALUATION REPORT

## SUMMATIVE ANALYSIS OF CAREER GUIDANCE

## PART I: SUMMATION OF PREVIOUS REPORTS AND

## PART II: FINAL ANALYSIS

CAREER GUIDANCE REPORT NO. 13

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

316-A

# AN AFFECTIVE EVALUATION REPORT

## CAREER GUIDANCE REPORT NO. 13

# Summative Analysis of Career Guidance
## Part I: Summation of Previous Reports
and
## Part II: Final Analysis

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August, 1976

This Study is a Product of the
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David A. Coyle
Director

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## INTRODUCTION TO THE AFFECTIVE REPORT SERIES

Mountain-Plains Research is divided into three broad areas with overlap. These areas are: 1) External Evaluation, 2) Instructional/Curriculum Evaluation, and 3) Affective Evaluation. Each of these areas is further subdivided as the logic of the research tasks within each dictates. This document is one report in the series "Affective Evaluation Reports". The six major series of reports in this research area are:

1. Counseling Services Reports
2. Career Guidance Reports
3. Early Childhood Education Reports
4. Parent Involvement Reports
5. Community Development Reports
6. General (Affective) Reports

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# FORWARD

A major difficulty in interpreting final analysis data was its abundance. The 73 data tables included seem excessive. Had data been reported exhaustively, multiples of that number would have been required. Where similar analyses showed similar effects, only one analysis is reported. Where analyses are peripheral to the understanding of effects on specified guidance program objectives (as opposed to being merely interesting), self discipline was exercised to avoid obscuring the core of the evaluation with side-trips. Where analyses merely confirm earlier preliminary findings given in the Part I summary, they are not reiterated, but rather are discussed only where there is contradiction.

After such extensive pruning, 68 quantitative data tables remain. To assist the reader, Tables 8, 9, 60, 65, and 73 summarize data from the quantitative tables. It is hoped that this will enable the reader to negotiate the labyrinth of data, and that it will be read and used rather than meeting the usual fate of such reports - being weighed and filed.

# SUMMATIVE ANALYSIS OF CAREER GUIDANCE:
# PART I - SUMMATION OF PREVIOUS REPORTS

## INTRODUCTION

Selection of an appropriate career consistent with student preferences and vocational characteristics, increased sophistication about the world of work, and adequate job getting, holding, and progression of personal skills (career maturity) are the encompassing goals of the Mountain-Plains Career Guidance Department. Following an extensive program redevelopment beginning in late 1973 and continuing through 1974, analyses were undertaken to better understand student vocational characteristics and study program effects. Results are documented in twelve Career Guidance Reports.

Career Guidance Report No. 1 (C.G.1) is an elaboration of the evaluation design for Career Guidance; including an appended "instrument" for assessing career choice and student self knowledge. Three of the remaining reports focus on understanding the vocational character of the population, dimensions of the assessment instruments, appropriateness of career fields offered, or "all of the above." Seven reports were preliminary assessments of guidance program effects/effectiveness.

The Career Guidance report series does not contain an extensive elaboration of the structure of the Career Guidance program and its operation. A brief description is available in Manley's article in the Education Tomorrow volume (Fenenbock, ed., 1975) and has the advantage of current availability in the ERIC system. (Longer descriptions will become available through the ERIC system by way of the Mountain-Plains Handbook currently under edit and the chapter by Herr, Conrad, Manley, and Seeley in the NIE monograph on Mountain-Plains currently being assembled.)

Contents of the Career Guidance Reports 2 through 12 will be summarized under the headings "Student Characteristics" and "Guidance Effects."

## STUDENT CHARACTERISTICS

In C.G.5 the maturity of career attitudes as measured by Crites Career Maturity Index was found to be about 11th grade. An increase to 13th grade was seen after three weeks of guidance with a regression to 12th grade at program departure indicated. This data reflects both need and effect.

C.G.6 explored the relationship between proactive personality characteristics as measured by the Personal Orientation Inventory and vocational interest as measured by the Ohio Vocational Interest Survey (OVIS). Although simple scale correlations were extremely low (.2 or less), the canonical analysis produced 5 scale sets with significant ($p < 0.05$) canonical R's ranging from .36 to .50. The main value of the report was in highlighting the relationship of personality process variables (as opposed to personality content traits) with occupational preference. This was especially important validation for Mountain-Plains Guidance (and Counseling) programs as both are based on developmental theories which give heavy weight to personality processes. Of secondary value was the description of vocational/personality process types defined by the sets.

C.G.10 was a companion study to C.G.6 and explored interest-personality relationship from a different (a trait-factor) approach using the Sixteen Personality Factor Questionnaire (16PF) as the personality measure. The canonical sets were stronger using the 16PF as expected from the known occupational correlations of 16PF scales. Six significant sets emerged with canonical correlations ranging from .39 to .83. Experimental use of the set scores in guidance was suggested. As in the first study, a comparison of training areas offered versus the descriptions was pursued and indicated some concern.

C.G.11 followed up C.G.6 and C.G.10 with development of three dimensional vocational types developed from profile analysis of factors from the OVIS (interest dimension), the Minnesota Importance Questionnaire (MIQ) (work value dimension), and the General Aptitude Test Battery (GATB) (aptitude dimension). Major objections were to: 1) define vocational types/categories in/for the population and to assess the congruence with occupational training chosen by individuals falling into these categories; 2) assess differences in program completion rates for different types and for persons whose training area was and was not congruent with their category; and 3) to assess the extent to which Mountain-Plains vocational areas matched student vocational characteristics.

For detail of type/categories, one should see the original report. Major findings in the other areas indicated that no Mountain-Plains training area was fully appropriate to significant (up to a half) of the students, but that students whose area was inappropriate to their vocational profile were as likely to succeed as those who were incompatible with their areas. Apparently, "school aptitude," "personality strength," "family support," or some such characteristic or characteristic combination was more important to success as measured by completion than "occupational congruence."

C.G.12 reported four useful factors (more than 15% reliable variance) which seem to depict the major aspects of career (im)maturity in the population. These were: 1) (General) Vocational Confusion (I don't know what work to do or how to find out); 2) Vocational Indifference (Work is dull and unpleasant and I don't care what I do just so I get money);

3) Occupational Cynicism (Influence and accident is how you get jobs); and 4) Occupational Disinterest (I don't know much about jobs - maybe I'll worry about it later and/or just take what comes along). While the factors themselves are of theoretical interest, the chief value of the analysis was to establish factors and reliabilities for summative analysis of Career Guidance effect on aspects of career maturity - the overall goal of Career Guidance.

## PRELIMINARY PROGRAM EFFECTS

C.G.2 indicated that students who displayed especially inappropriate vocational attitudes/behaviors became more "cooperative" and less "rebellious" as measured by the Responsibility Index after two weeks of role-playing treatment. More detail on the treatment is described in the report. C.G.7 showed that in a sample with less severe problems both male and female subjects became less "rebellious" but no change on "cooperation" scores was observed for either sex group.

C.G.8 explored the contributions of various guidance elements to career choice, and of the contribution of guidance variables to program completion. The major conclusion was that an integration within the "purely" vocational characteristics of the students and integration with other variables not included (personality, motivation, and the like) could better account for appropriateness of career choice than could these vocational traits and measures themselves. (The report further contained an editorial attack on one dimensional test-dependent guidance.)

It was predicted that as one of about 7 major program thrusts, guidance variables should be able to account for their share, or about 15% of completion variance. This proportion of success (as measured by program completion) could be accounted for by two guidance variables above. Inclusion of the guidance variable "choice" measurement set accounted for 26% of completion variance. It was noted that since Career Guidance consumed only about 2% of program expenses, it was apparently a very cost beneficial component.

C.G.9 (expands upon C.G.3) assessed satisfaction with "work" in occupational training as assessed by the Job Descriptive Index (JDI) and its relationship to progress and the guidance process. Work dissatisfied students, although of the same or higher intelligence as the norm for Mountain-Plains students as measured by the GATB "G" score, progressed slower than the Mountain-Plains student norm. This could not be attributed to career choice ratings. In fact, dissatisfied females were rated higher in appropriateness of career choice than satisfied females. For females one source of dissatisfaction was traced to one male guidance counselor who apparently subscribed to some outdated sterotypes concerning women and vocations. Male dissatisfaction could not be resolved with any guidance interpretation. Response to dissatisfaction was seen to accrue in that women who were dissatisfied tended to quit or persist at a slow (2/3 normal) rate of progress while men were more likely to seek a change in training. Use of the JDI "work" scale for staff-initiated discussion of training appropriateness was suggested as a useful follow-up of career choice.

Final analysis will elaborate preliminary studies; particularly in exploring subgroup differences and attitude dimensions of career maturity, as well as serving as a check on many preliminary findings.

# SUMMATIVE ANALYSIS OF CAREER GUIDANCE:
## PART II - FINAL ANALYSIS

## INTRODUCTION

Career Guidance at Mountain-Plains had three major goals. In order of attack as students progressed through the program these were: 1) Understanding of personal vocational characteristics and integrating this into a good career choice; 2) Developing a mature understanding about careers and the world of work; and 3) Developing personal attitudes/values about the workplace which would insure maximum probability of employment success. The assumption underlying these goals was that if one had self-vocational understanding, a good career choice, and an understanding both of the processes of career progression and working environments, that the person would find fulfillment both in the work itself, and in the material benefits accruing from employment.

Throughout its personal/vocational development program elements, Mountain-Plains has attempted to retain a student-client centered (as opposed to an employer centered) approach; within this realizing that knowledge of employer/marketplace demands and realities must be included. It has been the assumption that neither training everyone to be welders because there are many job openings in that area without concern for the student's work interests and values, nor encouraging pursuit of a particular personal interest which has little or no possibility of employment are appropriate to a student-centered educational design such as intended for Mountain-Plains. In the first instance, many soon leave the field of training - often equally disillusioned with work and education/training. In the second instance, informed persons walk the streets unable either to derive satisfaction from employment of their information or to accrue material benefits from it. It is within these goals and their underlying rationale that the program evaluation for Career Guidance should be interpreted. (For more detail as to guidance program elements, objectives, and evaluation see as referenced in Part I.)

## METHODOLOGY

Evaluation methodology for the Career Guidance program is given in detail in Manley and Conrad (1974). In the interest of readability for this report, it is here only summarized.

Subjects. Subjects are adult members of disadvantaged families. Average age is 25 years. Three-quarters of entering families are married couples and the remainder single females with dependent children. Two-thirds of enterers are "poverty" families as per the Office of Educational Opportunity formula. All students entering Mountain-Plains during 1974 and 1975 for whom all needed data was available are included in the analysis. Extensive descriptions of the sociological, psychological, and vocational characteristics are on record (e.g. Myers and Honrud, 1974; Conrad and McMahon, 1974; Conrad, 1974; Conrad and Bunch, 1976; Myers, 1975; Conrad, Manley, and Pollack, 1975; Myers, 1976; and Bunch, Conrad, Lewis, and Manley, 1976).

Design, Instrument, Procedures. These categories are elaborated at the beginning of each section of the report as they are different for each goal evaluation. Thus does the remainder of this report depart from the traditional APA format.

## VOCATIONAL CHARACTERISTICS AND CAREER CHOICE

Instrument. The instrument in use is the Career Aptitudes, Interests, and Values form (CAIV). The CAIV (Manley and Conrad, 1974) is not a psychological instrument in any formal sense. It is rather an organized system for quantifying student ability to relate their own vocational characteristics and various professional judgments from guidance counselors regarding career choice and probable success in training. It is not possible to establish meaningful reliability data for the form; however, some evidence of its validity has accrued in that it can illuminate differences between counselors and their guidance styles as well as predict significant amounts of variance in program completion categories. (See Conrad, 1976.)

Design. Assessment of career choice is categorized professional judgment. Facility in enumerating personal vocational characteristics is a simple tabulation by grouping of the correctness with which such can be enumerated by students completing guidance.[1]

Procedures. Following career guidance and career choice, a Guidance Aide whose basic duties are in the area of materials management (i.e. who has no specific guidance training or case load) asks students to name what they now believe to be their greatest occupational aptitudes. The Aide lists these on a form. Then the Aide asks for the student's perception of his lowest aptitudes, likewise listing these. This process is then repeated for interests and then for work needs/values. The student is encouraged to try to name at least three characteristics in the strongest and three in the weakest category in each dimension; however, he/she is not forced to do so nor is there any upper limit on the number which can be named. After the departure of the student, the Aide uses the test scores for the student and ranks the "objective" assessments of these domains and computes the proportion of the "n" responses given by the student with the top (or bottom as the case may be) "n + 1" characteristics given on the test.[2] Where the Aide was unsure as to the suitability of a student response (which need not be couched in vocational jargon!) to test categories, a professional staff member was consulted.

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[1] Unreported data on file shows that this ability increases significantly following guidance.

Following the completion of guidance and the making of a career choice, the guidance counselor considers the career choice and categorizes its consistency with both his overall perception of the student's vocational characteristics, and the raw test results. He also makes an overall evaluation of the appropriateness of the choice versus two standards - jobs in the world of work generally (absolute appropriateness) and versus careers offered by Mountain-Plains (relative appropriateness) and records a completion prediction. Categories for these ratings are given in the respective tables.

## RESULTS AND CONCLUSIONS: KNOWLEDGE OF CHARACTERISTICS AND CAREER CHOICE

Students are seen to have good knowledge of all three vocational "strength" characteristics following guidance, but only "fair" knowledge of vocational "weakness" characteristics (See Table 1.) The lower knowledge of "weaknesses" is logical, given the developmental/strength emphasis of the program. Table 3 shows that the effect is consistent over sexual subgroups with about 2/3 of students being more correct than incorrect (score of over 50%) in identifying vocational "strength" characteristics. Only among married women and then only on aptitudes can a clear departure among subgroups be seen. Married women seem to be more conscious of what they can't do than others.

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[2] e.g. If the student lists four strong aptitudes, and those four are all among the five strongest on the GATB, the "score" is 4/4=1.00. If only three of the student's four are in the top five, the score is 3/4=.75, etc.

Career choice, from all rating "directions" is categorized as "good." (See Table 2.) Table 4 data shows this categorization to be rather consistent across subgroups. Counselors rate career choice as at least "mostly consistent" with each vocational dimension in about 90% of the cases. The lowest consistency rating across subgroups is in the work needs/values area. This might be of concern in that knowledge of work needs/values emerged as the dimension most predictive of completion in an earlier study (Conrad, 1976).

As is logically predicted, career choice is rated better versus Mountain-Plains offerings than versus all careers in the world of work. This is seen in Table 6 to be relatively consistent across subgroups. This supports earlier findings (e.g. Conrad, Manley, and Pollack, 1975; Myers, 1975; Bunch, Conrad, Lewis, and Manley, 1976) that suggest the range of careers offered by Mountain-Plains is too narrow to adequately serve the target population. Still, over 70% of choices over subgroups are rated as more than "acceptable" on the more stringent criteria (see Table 6).

Both guidance and therapeutic counselors have traditionally contended that whether a family will complete and types of difficulty can be predicted before the student enters into the preparatory portion of Mountain-Plains. Guidance counselors recorded their predictions as recorded in Table 7. Apparently counselors are reluctant to predict failure as less than 1% of students are predicted to fail (not complete). However, the "completer with little or no difficulty" category completion prediction, ranging from roughly 70% to 80%, does reflect actual completion rates for the period.

The Table 7 results also highlight an often reported phenomenon - that occupational training per se is the area of least trouble for students, but that difficulties in negotiating the program are mostly with foundation education (reading and writing) and personal/family problems.

## CAREER MATURITY DEVELOPMENT

Good career choice, as examined in the previous section, has been assumed by Mountain-Plains to exist from the extensity of the exploration of vocational characteristics, the time devoted to the choice process, and the ability to "recycle" if necessary after reality testing. It was hypothesized that if Mountain-Plains could at the same time significantly enhance sophistication about careers and the world of work in a meaningful (internalized) way that this would be an important element in long range vocational success.

Instrument. Crites (1972) Career Maturity Index - Attitude Scale (CMI) - was chosen to measure a borderline area between belief and knowledge defined as career maturity. Crites scale has a reliability of 0.70. Validity evidence cited by Crites centers on sequential improvement of scores over grade levels. The child and adolesent development population for the instrument does not argue its validity for adults; however, instrumentation does not abound in this area and as used, the CMI seemed the most appropriate measure of the intended program goal.

To enrich understanding of career maturity development,apparent subscale dimensions of the CMI were pursued by factor analysis. Four factors, Vocational Confusion, Vocational Indifference, Occupational Cynicism, and Occupational Disinterest with reliabilities, respectively, of .76, .68, .53, and .39 were reported by Conrad (1976) as having interpretive value within intended effects of the program, and are included with Crites original scale in the analysis. Apart from the face value of the factors, no evidence of validity for the factors is yet available.

Design. The design is a pretest/post test one group study. T and F tests are used to test overall effects and among subgroups differences in effects. Subgroup differences are explored using the two dimensional analysis of covariance computed according to the October 11, 1974 version of the Biomedical program.

Procedures. During orientation to Mountain-Plains and before initiation of any treatment or training, students are administered the CMI under standard testing conditions. Tests are again administered following completion of Mountain-Plains and/or at the time of resignation from the program (and thus are overall program rather than just career guidance effects measures.) Scores for each item are coded and keypunched. Crites' score was derived by simple computer addition of the appropriate scale responses. Factor scores were computed using the weights derived from factor analysis of entry test scores. In the two dimensional analyses, row and column means are unweighted (assigning equal weight to each cell regardless of number of subjects). A "real" difference is credited whenever the difference in unweighted means exceeds 1/3 of the average (unweighted) standard deviation. An "i" in a data table means that the difference (or sameness) is apparent by inspection and detailed calculations were not made and/or are not recorded. The exception is the sex-by-ethnicity analysis of career maturity which reports weighted marginal means and the results of related samples t-tests.

In instances where significant differences ($p \leqslant 0.10$) are not seen in two dimensional analyses, cell means may not be reported.

## CAREER MATURITY RESULTS

As considerable difference in effect is seen for various subgroups, results will be explored for each subgroup. These results are summarized in Tables 8 and 9. Detailed analyses are given in Tables 10 through 59.

Males. Males show gain on overall career maturity, but not on any subdimensions. Source of change for this group seems to be centered in CMI items other than those loading on the factors evaluated.

Married Females. Married women increase overall maturity. A decrease in confusion is also seen.

Single Female. The single female results are identical with those for males.

"Whites." Whites make overall maturity gains, but become more indifferent.

Indians. Indians gain on overall maturity and become less indifferent.

"Chicano's." Chicano's gain on no maturity dimension, and become more disinterested.

Full Completers. Students who complete all portions of the program gain more overall maturity, and become less indifferent.

Core Completers. Students who complete the core curriculum, but not occupational training, do not change on overall maturity, but become more confused, more cynical, and less interested in vocations.

Dropouts. Students who depart without completing even the core curriculum, score as unchanged on the overall score, but score as both more confused and more indifferent than at entry.

Office Education. Students in office education gain on overall career maturity and become less confused and less cynical.

Lodging. Lodging students gain overall maturity while becoming less indifferent and less cynical.

Food Services. Food services students gain overall maturity but become less occupationally interested.

Marketing. Marketing students gain overall maturity while becoming more indifferent and more cynical.

Counselors. No systematic gain pattern can be seen among counselors.

Program Periods. A decreasing gain pattern over time is seen for career guidance with gains on three of five scores and a loss on one changing to losses on three and no gain on two.

Confirmation of the different effects on different groups implicit in the different pattern of gains summarized in Table 8 and narrated above are confirmed by the two dimensional analyses of covariance. Gain differences are confirmed on overall maturity, confusion, and disinterest among sex/marital status subgroups. Similarly, ethnicity and completion status differences are seen on all variables except cynicism; program period differences on confusion; occupational area differences on disinterest; and counselor differences on overall maturity and confusion. Conversely, overall maturity is seen as a function of sex, ethnic group, completion, and counselor. Confusion is a function of sex, ethnic group, completion, period, and counselor. Indifference is a function of ethnic group and completion. Cynicism is not a differential function of any subgrouping, and disinterest is a function of sex, ethnicity, completion, and training area. Complex! In light of Conrad and Manley's (1975) report, it is probable that each of the subgroupings constitutes a counter treatment which detracts from gains made during guidance efforts at varying intensities rather than being a positive contributor to effect.

## CMI ANALYSIS BY ITEM

To better understand changes taking place apart from the total and factor scores, each CMI item was analyzed for each of the sex subgroups. Table 60[3] summarizes the analysis with data detailed in Tables 61-64.

Departing men show more feeling that: 1) Working will be similar to Mountain-Plains (Item 26); 2) they understand career decisions better (Item 33); but 3) also seem to revert to old choice desires (Item 34).

Men also more want to do something spectacular (Item 35), and more tend to believe influence is more important than ability (Item 37), are less altruistic (Item 39) and have an increased belief in "fate" determining job choice (Item 50), (although this item would seem to reflect the difficulties inherent in the placement effort which are concomitant with post testing than program developmental effects).

Marrieds (male and female) more subscribe to their own career decision desires (Item 38).

Married women feel more knowledgeable about work (Item 41).

Women (married and single) more feel they can enjoy some kind of work (Item 43), even if it is contrary to their beliefs (Item 46), and married women are apparently breaking parental dependencies (Item 25).

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[3] Narrative treatment of item scores is not exhaustive, and further pursuit of Table 60 may be useful to the reader.

Men and married women seem to be giving up unrealistic career fantasies (Item 18).

On eight of the fifty items (2, 3, 4, 12, 14, 17, 31, and 36), all groups score very favorably at entry; leaving little room to improve. Seven items (5, 11, 13, 30, 32, 45, and 49) seem to have room for improvement, but none accrues.

The overall group's progress seems to be centered in feeling that they: 1) Now have a career choice (Items 10 and 48); 2) have sorted through the "flack" about how to choose a career (Item 15); 3) know how to get into the career (Item 16); 4) feel they are being prepared for it (Item 27); and 5) know the job's requirements (Item 28). It is not surprising that most of these items reflect direct specific goals (knowing how to choose, making a choice, knowing requirements, knowing how to enter) of the guidance program.

However, there is also indication that marrieds may be postpoing their "real" career choice until after Mountain-Plains (Item 6), and are coming to overvalue extrinsic rewards (Items 7 and 8) while women are less attentive to future career plans (Item 23). Men may also be "overlearning" the idea of horizontal career mobility (Item 20).

## RESULTS AND CONCLUSIONS

Employee Attitudes. Staff report that many Mountain-Plains students experience a great deal of role centered conflict in dealing with teachers, and examination of pre-program records indicates that this is often an extension of previous conflicts with coworkers and supervisors which has contributed to past employment instability. Certain of these conflicts seemed to remain as students neared completion - unremediated by previous program treatments. Role playing as described by Manley and Conrad (1975) is used to assist students in relearning response styles. Although an individual approach is used, a tendency to be irresponsibly critical or to "go along" (as opposed to responding objectively) was seen as a frequent/common element. This element(s) was tapped for measure as an indication of effect.

Instrument. The instrument is the Responsibility Index (RI) developed by Elsass and Sweney (1972). It consists of 34 forced choice items, each with three possible responses which the subject rank orders. Reliabilities for the scales Rebel, Cooperator, and Ingratiator are, respectively, .87, .92, and .91. The authors offer various validity evidence, and the Rebel and Cooperator scales were able to differentiate between pre- and post- treatment subjects in an earlier Mountain-Plains study (Conrad and Manley, 1975).

Design. A pretest - post test one group design is used with differences assessed using the t-test for related samples.

Procedures. Upon nearing completion of the program, students enter into role playing as described by Manley and Conrad (1975). The RI is administered during the first and last meetings by a professional counselor under standard testing conditions. Tests are then scored by an aide, and scale scores coded with sex and ethnic group and keypunched pending subsequent analysis.

Total Group. Overall, students became less rebellious and less ingratiating. The cooperator score did not improve for the overall group. Comparison of Table 66 data to norms for the instrument indicates students to be at the adult norm on cooperation[4] by the time they entered Role-Playing; although

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[4] Where persons with severe problems were subjects of treatment, Cooperator scores were seen in a previous study (Conrad and Manley, 1975) to improve as well.

(unpublished) data indicates this was not true at program entry. Apparently students come to the end of their Mountain-Plains experience still with a dual tendency to be reactively negative (rebel) in employment related situations as well as to be a "yes man" to persons in authority (Ingratiate). The guidance role playing program is seen as effective in blunting this "rough edge" as students prepare to depart the program.

Subgroups. Males become less rebellious,[5] but do not record changes on the Cooperator or Ingratiator scales. Married females replicate the overall student results pattern while single females make no changes. The white subgroup numerically domintes the sample and shows the same result pattern as for the all-student group. Indian students became less rebellious and more cooperative, but (already normative) ingratiation scores do not change. Chicano students do not change, but scores at entry into treatment are already in the normal range (Sten scores of 5-6 versus the instrument norm); indicating previous impact on these areas during program treatment and/or normal development at entry.

## DISCUSSION

Overall Guidance Effects. Table 73 summarizes effects by program goal/ objective. Overall, results are quite favorable. The exhaustive treatment of the career maturity variable by subdimension and by subgroup reveals the complexity involved in impacting such a dimension. "Career maturity" seems so simple rolling glibly from the tongue and written neatly in an objective list. Clearly, many influences, including sociodemographic "history," counselor assigned to initial treatment, and type and extent of reinforcement in extra-guidance treatments all influence career maturity attitudes and can influence its various dimensions differently.

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[5] Keeping in mind that we here mean Elsass and Sweeny's (1972) page-long definition which summarizes as generalized negativism.

Validity of Guidance Counselor Ratings. Career selection seems to be a strong point of the program; although guidance staff may have Festingeristic investments in rating a choice favorably because of their role in its facilitation. A reluctance to make a bad (failure) prediction (a reluctance many would argue is a general debilitating factor with helping professionals) is seen in the completion prediction ratings which would support the idea that choice ratings may have an artifical inflation. Support for the quality of career choice, on the other hand, accrues from the fact that only about one student in thirty changes career choice (Source: Mountain-Plains records).

Effects of Program Changes. It seems that the Mountain-Plains program as operating in 1974 was more effective in the development of career maturity than subsequently. Persons wishing to model on Mountain-Plains for guidance services which have objectives beyond career choice might be advised to adopt the earlier program design and staffing.

Staffing Effects. Consistent with the final cognitive analysis (Bunch, 1976), Table 8 shows different counselors achieve different results. Examination of cell data in Tables 50-54 shows that impacts vary over dimensions of career maturity and by ethnicity of clients. A major conclusion shared by all Mountain-Plains research staff is the importance of "staff competency." This seems to be even more important than the program structure within which the staff member functions in many (probably most) cases.

### Modeling and Maximum Possible Gain.

An overall evaluation of guidance and other developmental data at Mountain-Plains accrues strong support to a "modeling" interpretation of developmental effects. Where students enter with scores below adult norms, they tend to make gains. Where scores are at or above adult norms, they tend to remain unchanged or to regress slightly.[6] The maximum developmental "power" of any program would thus be the average development of the staff on the dimension of development intended. To the extent this perception is valid, a major error in the design of Mountain-Plains was a failure to insure career maturity and productive vocational attitude/role perceptions among staff by an appropriate combination of selection and training.

Generalizability. A major problem with data in this report is that different subjects appear in nearly every analysis. This results from: 1) The necessity of filling cells in the two dimensional analyses; 2) The fact that testing on different variables was initiated at different times - the guidance evaluation design being implemented relatively late in the program; and 3) Differences in personnel, testing, and administrative procedures that made it more probable that certain subgroups or tests would be missed. Wherever possible, data has been cross-checked in other analyses and or verified by comparison to filed or previously reported data. Still, one would want to be very careful about drawing, for example, a conclusion about role-playing effects on Indians from the sample of eight on which full data is reported. The overall report gives indications and insights. However, as is the case with evaluation research generally, only the complexity of the situation is proven.

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[6] This cannot be dismissed as "mean regression" as the adult norm and Mountain-Plains population norm are different. It could also be argued that the phenomenon of mean regression may itself have a "mass modeling" effect component.

## Table 1

### Ability to Name Vocational Characteristics Following Guidance

| | Rating Category and Score* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | (1.5) | | (2.5) | | (3.5) | |
| Characteristics Named | | Poor | ↑ | Fair | ↑ | Good | ↑ | Excellent |
| Strong Aptitudes | | | | | | 2.97 | | |
| Weak Aptitudes | | | | 2.03 | | | | |
| Strong Interests | | | | | | 2.77 | | |
| Weak Interests | | | | 2.23 | | | | |
| Important/Positive Needs/Values | | | | | | 3.05 | | |
| Weak/Negative Needs/Values | | | | 1.93 | | | | |
| | ① | | ④ | | ⑧ | | ⑫ | |
| Overall Vocational "Strength" Characteristics | | | | | | 8.77 | | |
| Overall Vocational "Weakness" Characteristics | | | | 6.20 | | | | |
| Mean Total for Characteristics | | | | 7.39 | | | | |

* Description of Category Arbitrarily Determined.

Table 2

Counselor Rating of Career Choice

| | Rating Category and Scale* | | | | | | |
|---|---|---|---|---|---|---|---|
| Choice Dimension Rating | Poor | (1.5) ↑ | Fair | (2.5) ↑ | Good | (3.5) ↑ | Excellent |
| Abilities Consistent With Career Choice | | | | | 3.32 | | |
| Interests Consistent With Career Choice | | | | | 3.29 | | |
| Values Consistent With Career Choice | | | | | 3.06 | | |
| | | ④ ↑ | | ⑧ ↑ | | ⑫ ↑ | |
| Overall Appropriateness of Choice vs. Vocational Characteristics | | | | | 9.68 | | |
| | | ② ↑ | | ③ ↑ | | ④ ↑ | |
| Overall Choice Appropriateness vs. WOW | | | | | 3.78 | | |
| Overall Choice Appropriateness vs. Mountain-Plains | | | | | 3.98 | | |
| | | (1.5) ↑ | | (2.5) ↑ | | (3.5) ↑ | |
| Choice Appropriate Aptitude Test Results | | | | | 3.18 | | |
| Choice Appropriate Interest Test Results | | | | | 3.19 | | |
| Choice Appropriate Validity Test Results | | | | | 2.97 | | |
| | | ④ ↑ | | ⑧ ↑ | | ⑫ ↑ | |
| Choice Appropriate Overall Vocational Test Results | | | | | 9.34 | | |

* Categories correspond approximately to counselor designations of "Definitely Inconsistent/Inappropriate," "Mostly Inconsistent/Inappropriate," Mostly Consistent/Appropriate," and "Definitely Consistent/Appropriate."

## Table 3

## Ability of Students to Correctly List Own Vocational Characteristics Following Guidance by Subgroup

| | | | Percentage of Respondents Falling Into Each Category | | | | |
|---|---|---|---|---|---|---|---|
| | | | Percent Named Correctly | | | | |
| | | | 25 or less | 26-50 | 51-75 | 76-100 | NR |
| 1. | "Strong" Aptitudes Named Correctly | Male | 8.0 | 22.0 | 34.1 | 34.8 | 1.1 |
| | | Married Female | 8.4 | 19.8 | 33.3 | 38.0 | .4 |
| | | Single Female | 8.4 | 22.9 | 30.1 | 38.6 | 0 |
| 2. | "Weak" Abilities Named Correctly | Male | 40.5 | 31.8 | 14.0 | 12.5 | 1.1 |
| | | Married Female | 32.9 | 30.4 | 21.5 | 14.8 | .4 |
| | | Single Female | 42.2 | 36.1 | 6.0 | 14.5 | 1.2 |
| 3. | "Strong" Interests Named Correctly | Male | 7.2 | 31.8 | 37.5 | 23.1 | .4 |
| | | Married Female | 8.9 | 30.8 | 34.2 | 25.3 | .8 |
| | | Single Female | 8.4 | 25.3 | 32.5 | 32.5 | 1.2 |
| 4. | "Dis-" Interests Named Correctly | Male | 24.6 | 36.0 | 25.8 | 13.3 | .4 |
| | | Married Female | 24.9 | 40.1 | 25.3 | 8.9 | .8 |
| | | Single Female | 25.3 | 33.7 | 25.3 | 14.5 | 1.2 |
| 5. | "Positive" Work Needs/ Values Named Correctly | Male | 7.2 | 17.8 | 26.1 | 45.8 | 3.0 |
| | | Married Female | 8.9 | 18.6 | 24.1 | 45.6 | 3.0 |
| | | Single Female | 6.0 | 16.9 | 21.7 | 54.2 | 1.2 |
| 6. | "Negative" Work Needs/ Values Named Correctly | Male | 40.5 | 28.4 | 18.2 | 9.5 | 3.4 |
| | | Married Female | 32.5 | 37.1 | 19.8 | 7.6 | 3.0 |
| | | Single Female | 33.7 | 41.0 | 16.9 | 7.2 | 1.2 |

## Table 4

### Consistency of Career Choice and Results of Vocational Tests by Subgroup

| Test | | % Consistent | | % Inconsistent | | |
|---|---|---|---|---|---|---|
| | | Definitely | Mostly | Mostly | Definitely | NR |
| GATB | Male | 47.7 | 38.6 | 9.5 | 1.1 | 3.1 |
| | Married Female | 40.9 | 40.1 | 7.2 | .8 | 11.0 |
| | Single Female | 50.6 | 37.3 | 10.8 | 0 | 1.2 |
| OVIS | Male | 52.7 | 40.9 | 5.3 | 0 | 1.1 |
| | Married Female | 35.9 | 41.8 | 10.1 | 2.5 | 9.7 |
| | Single Female | 36.1 | 54.2 | 6.0 | 1.2 | 2.4 |
| MIQ | Male | 31.8 | 51.9 | 9.5 | 1.5 | 5.3 |
| | Married Female | 26.6 | 54.0 | 5.5 | 2.1 | 11.8 |
| | Single Female | 34.9 | 54.2 | 7.2 | 2.4 | 1.2 |
| Overall Test Results | Male | 59.1 | 35.2 | 4.9 | 0 | .8 |
| | Married Female | 46.9 | 39.7 | 3.8 | 0 | 9.7 |
| | Single Female | 56.7 | 42.1 | 0 | 0 | 1.2 |

## Table 5

## Consistency of Career Choice and Counselor Evaluation of Vocational Characteristics by Subgroup

| Vocational Characteristics | | % Inconsistent | | % Consistent | | |
|---|---|---|---|---|---|---|
| | | Definitely | Mostly | Mostly | Definitely | NR |
| Aptitudes | Male | 0 | 4.9 | 42.8 | 51.5 | .8 |
| | Married Female | 0 | 4.6 | 42.2 | 44.3 | 8.9 |
| | Single Female | 0 | 3.6 | 41.0 | 54.2 | 1.2 |
| Interests | Male | 0 | 1.9 | 39.4 | 57.6 | 1.1 |
| | Married Female | .4 | 5.9 | 47.7 | 37.1 | 8.9 |
| | Single Female | 0 | 6.0 | 53.0 | 39.8 | 1.2 |
| Work Needs/Values | Male | 0 | 5.3 | 50.4 | 38.6 | 5.7 |
| | Married Female | .4 | 4.6 | 57.4 | 27.0 | 10.5 |
| | Single Female | 1.2 | 6.0 | 56.6 | 34.9 | 1.2 |

Note: Male, n of 264; Married Female, n of 237; Single Female, n of 83.

## Table 6

## Rating of Appropriateness of Career Choices by Subgroup

| Rating With Respect to: | | Very Appropriate | Appropriate | Acceptable | Inappropriate | Very Inappropriate | NR |
|---|---|---|---|---|---|---|---|
| Careers in the World of Work | Male | 22.7 | 51.9 | 23.9 | .4 | .4 | .8 |
| | Married Female | 20.3 | 40.9 | 30.8 | 1.3 | 0 | 6.8 |
| | Single Female | 20.5 | 44.6 | 33.7 | 0 | 0 | 1.2 |
| Careers offered by Mountain-Plains | Male | 34.8 | 45.5 | 17.8 | .8 | .4 | .8 |
| | Married Female | 25.3 | 47.3 | 19.8 | .8 | 0 | 6.8 |
| | Single Female | 32.5 | 53.0 | 12.0 | 1.2 | 0 | 1.2 |

## Table 7

## Guidance Counselor Assessment of Student Progress Prospects Following Guidance by Subgroup

| | Male | Married Female | Single Female |
|---|---|---|---|
| Will complete with little or no difficulty. | 67.0% | 70.0% | 80.7% |
| Will complete, but will have difficulty in the foundation education area. | 13.3 | 9.3 | 4.8 |
| Will complete, but will experience difficulty in the personal/family area. | 10.2 | 8.4 | 10.8 |
| Will complete, but will experience difficulty in occupational preparation unrelated to B or C above. | 5.7 | 3.8 | 1.2 |
| Will not complete due to difficulties experienced in foundation education. | 1.5 | .4 | 0 |
| Will not complete due to difficulties experienced in personal/family area. | .4 | .4 | 0 |
| Will not complete because of difficulties experienced in occupational preparation unrelated to E or F above. | 0 | 0 | 0 |
| NR | 1.9 | 7.7 | 2.5 |
| Overall: Complete Easily | 67.0 | 71.3 | 79.5 |
| Complete With Difficulty | 31.8 | 21.1 | 19.3 |
| Will Not Complete | .8 | .8 | 0 |
| NR | .4 | 6.8 | 1.2 |

## Table 8

### Summary Table for Career Maturity Gain by Subgroup

| | See Table(s) No. | CMI Scores | | | | |
|---|---|---|---|---|---|---|
| | | Overall | Confusion | Indifference | Cynacism | Disinterest |
| Male | 10 - 14 | + | o | o | o | o |
| Married Female | " | + | + | o | o | o |
| Single Female | " | + | o | o | o | o |
| "White" | " | + | o | - | o | o |
| Indian | " | + | o | + | o | o |
| "Chicano" | " | o | o | o | o | - |
| Complete All | 20 - 24 | + | o | + | o | o |
| Complete Core | " | o | - | o | - | - |
| Complete None | " | o | - | - | o | o |
| Fall, 1974 | 30 - 34 | + | o | + | + | - |
| Winter, 1974-75 | " | + | + | + | o | o |
| Spring, 1975 | " | o | o | o | o | o |
| Summer, 1975 | " | o | - | o | o | o |
| Fall, 1975 | " | o | - | - | o | - |
| Office Education | 40 - 44 | + | + | o | + | o |
| Lodging | " | + | o | + | + | o |
| Food Services | " | + | o | o | o | - |
| Marketing | " | + | o | - | - | o |
| Counselor No. 1 | 50 - 54 | o | o | o | - | o |
| Counselor No. 2 | " | + | - | - | o | o |
| Counselor No. 3 | " | + | + | + | o | o |
| Counselor No. 4 | " | o | o | o | + | o |
| Counselor No. 5 | " | o | o | o | o | o |
| Counselor No. 8 | " | o | o | o | o | - |
| Counselor No. 10 | " | + | + | + | + | - |

Note: Counselors and Occupational Areas not included . Recorded too few subjects in one or more cells to allow the two dimensional program used in the analysis to execute.

Table 9

Summary Table for Career Maturity Gain Difference by Subgroup

| Subgroup | See Table(s) No. | CMI Gain Difference ($p \leq .10$) | | | | |
|---|---|---|---|---|---|---|
| | | Overall | Confusion | Indifference | Cynacism | Disinterest |
| Sex and Marital Status | 15 - 19 | Yes | Yes | No | No | Yes |
| Ethnicity | 15 - 19<br>26,27,39 | Yes | Yes | Yes | No | Yes |
| Completion Status | 25 - 29 | Yes | Yes | Yes | No | Yes |
| Program Period | 35 - 39 | No | Yes | No | No | No |
| Occupational Area | 45 - 49 | No | No | No | No | Yes |
| Counselor | 55 - 59 | Yes | Yes | No | No | No |

## Table 10

### Overall Career Maturity by Sex and Ethnic Group

| | | Male | | Single Female | | Married Female | | Raw Totals | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | t | | | | | |
| "White" | Pre | 36.1 | 4.32 | 37.2 | 3.99 | 36.8 | 4.30 | 36.6 | 4.26 | 3.82* | | | | | |
| | Post | 37.1 | 5.28 | 39.6 | 4.28 | 38.0 | 5.11 | 37.8 | 5.26 | | | | | | |
| | N | 112 | | 37 | | 104 | | 253 | | | | | | | |
| | | | | | | | | | | | | | $\bar{X}$ | SD | t |
| Indian + Chicano Combined | Pre | 32.5 | 5.44 | 38.5 | 2.12 | 33.9 | 3.89 | | | | Indian | Pre | 33.6 | 3.93 | 5.38* |
| | Post | 36.0 | 3.80 | 46.5 | 2.12 | 36.4 | 4.73 | | | | | Post | 38.4 | 4.46 | |
| | N | 21 | | 2 | | 18 | | | | | | N | 20 | | |
| | | | | | | | | | | | Chicano | Pre | 33.2 | 5.62 | 1.66 |
| | | | | | | | | | | | | Post | 35.0 | 4.41 | |
| | | | | | | | | | | | | N | 21 | | |
| Column Totals | Pre | 35.6 | 4.73 | 37.3 | 3.91 | 36.1 | 4.83 | | | | | | | | |
| | Post | 37.0 | 5.10 | 39.9 | 5.38 | 37.5 | 5.32 | | | | | | | | |
| | N | 133 | | 39 | | 122 | | | | | | | | | |
| Pre/Post t | | 3.12* | | 2.92* | | 3.29* | | | | | | | | | |

## Table 11

### CMI - Vocational Confusion - Sex by Ethnic Group

| Ethnic Group | | Male $\bar{X}$ | Male SD | Single Female $\bar{X}$ | Single Female SD | Married Female $\bar{X}$ | Married Female SD | Raw Totals $\bar{X}$ | Raw Totals SD | Raw Totals t |
|---|---|---|---|---|---|---|---|---|---|---|
| "White" | Pre | .112 | .961 | .001 | .999 | .055 | .959 | .072 | .963 | -.720 |
| | Post | -.047 | .770 | .303 | .631 | .010 | .860 | .027 | .797 | |
| | N | 112 | | 37 | | 104 | | | | |
| Indian & Chicano Combined | Pre | .032 | 1.126 | -.502 | .354 | -.009 | .759 | | | |
| | Post | -.360 | 1.050 | .624 | .050 | .038 | 1.010 | | | |
| | N | 21 | | 2 | | 18 | | | | |
| Column Totals | Pre | .112 | .981 | -.025 | .981 | .028 | .944 | | | |
| | Post | -.089 | .818 | .320 | .618 | -.003 | .888 | | | |
| | N | 133 | | 39 | | 122 | | | | |
| | t | -.239 | | 1.97* | | -.343 | | | | |

| | | $\bar{X}$ | SD | t |
|---|---|---|---|---|
| Indian | Pre | .130 | .928 | .348 |
| | Post | .206 | .901 | |
| | N | 20 | | |
| Chicano | Pre | -.148 | .966 | -1.21 |
| | Post | -.465 | 1.051 | |
| | N | 21 | | |

## Table 12

## Vocational Indifference by Sex and Ethnic Group

| | Testing | | | | |
|---|---|---|---|---|---|
| | Pre | | Post | | |
| Subgroup | $\bar{X}$ | SD | $\bar{X}$ | SD | t |
| Male | .042 | 1.044 | -.079 | 1.120 | -.985 |
| Single Female | .223 | .440 | .149 | .895 | -.472 |
| Married Female | -.037 | .985 | .039 | .988 | .811 |
| "White" | .163 | .561 | .020 | 1.063 | -2.09* |
| Indian | -.269 | .804 | .207 | .497 | 2.52* |
| "Chicano" | -.517 | 2.132 | -.238 | .800 | .584 |

Note: As no differences are recorded among groups ($p \leq .10$) cell means are not reported.

Table 13

Occupational Cynicism by Sex and Ethnic Group

| Subgroup | Testing |  |  |  |  |
|---|---|---|---|---|---|
|  | Pre |  | Post |  |  |
|  | $\bar{X}$ | SD | $\bar{X}$ | SD | t |
| Male | -.037 | 1.011 | .028 | 1.061 | .619 |
| Single Female | .328 | .892 | .222 | .994 | -.710 |
| Married Female | -.080 | 1.002 | -.099 | .805 | -.188 |
| "White" | .047 | .956 | .024 | .931 | -.327 |
| Indian | -.450 | 1.277 | -.200 | 1.336 | 1.053 |
| "Chicano" | -.113 | 1.132 | -.178 | .861 | -.200 |

Note: As no differences are recorded among groups ($p \leqslant .10$) cell means are not reported.

## Table 14

## CMI - Occupational Disinterest By Sex and Ethnicity

| | | Sex & Marital Status Group | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Male | | Single Female | | Married Female | | Raw Totals | | | | |
| Ethnic Group | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | | | $\bar{X}$ | SD | t |
| "White" | Pre | -.02 | .90 | .19 | .81 | .10 | .95 | | | .060 | .91 | -.614 |
| | Post | -.16 | .91 | .19 | .67 | .15 | .87 | | | .019 | .87 | |
| | N | 112 | | 37 | | 104 | | | | | | |
| Indian & Chicano Combined | Pre | -.20 | 1.36 | .47 | 1.41 | .53 | .84 | Indian | Pre | .164 | 1.33 | -.455 |
| | Post | -.35 | .97 | .97 | .12 | .03 | .93 | | Post | .003 | .97 | |
| | N | 21 | | 2 | | 18 | | | N | 20 | | |
| | | | | | | | | Chicano | Pre | .136 | 1.06 | -2.01* |
| | | | | | | | | | Post | -.235 | .98 | |
| | | | | | | | | | N | 21 | | |
| Column Totals | Pre | -.04 | .98 | .101 | 1.05 | .10 | 1.05 | | | | | |
| | Post | -.17 | .92 | .109 | .89 | .11 | .89 | | | | | |
| | N | 133 | | 39 | | 122 | | | | | | |
| | t | -1.29 | | .18 | | .09 | | | | | | |

Table 15

Analysis of Variance for Overall Career Maturity by Sex and Ethnicity

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1,943.60 | 1 | 1,943.60 | 88.47 | .001 |
| Ethnic Group | 66.38 | 1 | 66.38 | 3.02 | .083 |
| Sex & Marital Status | 162.84 | 2 | 81.42 | 3.71 | .026 |
| Interaction | 74.35 | 2 | 37.18 | 1.69 | .186 |
| Covariate | 1,157.54 | 1 | 1,157.54 | 52.69 | .001 |
| Error | 6,305.09 | 287 | 21.97 | ---- | ---- |

Table 16

Analysis of Variance for Vocational Confusion by Sex and Ethnicity

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .69 | 1 | .69 | 1.19 | .276 |
| Ethnic Group | .10 | 1 | .10 | .17 | .684 |
| Sex & Marital Status | 5.07 | 2 | 2.53 | 4.37 | .013 |
| Interaction | 1.60 | 2 | .80 | 1.38 | .252 |
| Covariate | 29.43 | 1 | 29.43 | 50.78 | .001 |
| Error | 166.36 | 287 | .58 | ---- | ---- |

## Table 17

### Analysis of Variance for Vocational Indifference by Sex and Ethnicity

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .29 | 1 | .29 | .28 | .595 |
| Ethnic Group | .22 | 1 | .22 | .21 | .645 |
| Sex & Marital Status | .26 | 2 | .13 | .13 | .881 |
| Interaction | 1.64 | 2 | .82 | .80 | .448 |
| Covariate | 9.16 | 1 | 9.16 | 9.02 | .003 |
| Error | 291.54 | 287 | 1.02 | ---- | ---- |

## Table 18

### Analysis of Variance for Occupational Cynicism by Sex and Ethnicity

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1.30 | 1 | 1.30 | 1.57 | .211 |
| Ethnic Group | .95 | 1 | .95 | 1.15 | .285 |
| Sex & Marital Status | 3.71 | 2 | 1.85 | 2.25 | .108 |
| Interaction | 3.30 | 2 | 1.65 | 2.00 | .137 |
| Covariate | 22.70 | 1 | 22.70 | 27.52 | .001 |
| Error | 236.79 | 287 | .83 | ---- | ---- |

## Table 19

Analysis of Variance for Occupational Disinterest by Sex and Ethnicity

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .44 | 1 | .44 | .63 | .427 |
| Ethnic Group | .16 | 1 | .16 | .23 | .634 |
| Sex & Marital Status | 4.23 | 2 | 2.11 | 3.05 | .049 |
| Interaction | 1.51 | 2 | .76 | 1.09 | .338 |
| Covariate | 20.23 | 1 | 20.23 | 29.17 | .001 |
| Error | 199.03 | 287 | .69 | ---- | ---- |

Table 20

Overall Career Maturity: Ethnicity by Completion

| | | Completion | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Complete Core & Prep. | | Complete Core Only | | Complete Nothing | | Raw Means | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | 36.7 | 4.00 | 36.0 | 5.24 | 35.5 | 6.16 | 36.1 | i | i |
| | Post | 38.4 | 4.93 | 36.9 | 4.19 | 29.9 | 7.06 | 35.1 | | |
| | N | 208 | | 30 | | 12 | | | | |
| Indian | Pre | 34.2 | 3.94 | 34.8 | 2.50 | 29.5 | 4.94 | 32.8 | i | i* |
| | Post | 39.8 | 3.70 | 37.8 | 3.86 | 35.0 | 5.66 | 37.5 | | |
| | N | 13 | | 4 | | 2 | | | | |
| "Chicano" | Pre | 33.0 | 5.62 | 35.4 | 5.22 | 29.5 | 7.78 | 32.6 | i | i |
| | Post | 36.4 | 4.47 | 33.4 | 2.40 | 29.5 | 2.12 | 33.1 | | |
| | N | 14 | | 5 | | 2 | | | | |
| Column Totals | Pre | 34.6 | i | 35.4 | i | 31.5 | i | | | |
| | Post | 38.2 | | 36.0 | | 31.5 | | | | |
| | N | 235 | | 39 | | 16 | | | | |
| | $\Delta\bar{X}$/SD | i* | | i | | i | | | | |

## Table 21

## Vocational Confusion: Ethnicity by Completion

|  |  | Completion |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Complete Core & Prep. |  | Complete Core Only |  | Complete Nothing |  | Raw Means |  |  |
| Ethnicity |  | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta \bar{X}$/SD |
| "White" | Pre | .06 | .94 | .07 | 1.10 | .25 | .98 | .13 | i | - i* |
|  | Post | .09 | .75 | -.13 | .94 | -.67 | .96 | -.24 |  |  |
|  | N | 208 |  | 30 |  | 12 |  |  |  |  |
| Indian | Pre | .04 | 1.10 | .44 | .79 | .19 | .15 | .22 | i | i |
|  | Post | .34 | .77 | .45 | .53 | -.01 | 1.21 | .26 |  |  |
|  | N | 13 |  | 4 |  | 2 |  |  |  |  |
| "Chicano" | Pre | -.23 | .96 | .00 | .96 | .05 | 1.65 | -.06 | i | i |
|  | Post | -.14 | .89 | -.80 | 1.05 | -1.92 | 1.08 | -.95 |  |  |
|  | N | 14 |  | 5 |  | 2 |  |  |  |  |
| Column Totals | Pre | -.04 | i | .17 | .90 | .16 | i |  |  |  |
|  | Post | .10 |  | -.16 |  | -.87 |  |  |  |  |
|  | N | 235 |  | 39 |  | 16 |  |  |  |  |
|  | $\Delta \bar{X}$/SD | i |  | -.37* |  | -i* |  |  |  |  |

## Table 22

### Vocational Indifference: Ethnicity by Completion

| | | Completion | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Complete Core & Prep. | | Complete Core Only | | Complete Nothing | | Raw Means | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta \bar{X}/SD$ |
| "White" | Pre | .23 | .50 | -.14 | .78 | -.16 | .59 | -.02 | i | i* |
| | Post | .10 | .97 | .16 | .59 | -1.67 | 1.87 | -.47 | | |
| | N | 208 | | 30 | | 12 | | | | |
| Indian | Pre | -.01 | .63 | -.79 | 1.02 | -.97 | 1.20 | -.59 | i | i* |
| | Post | .36 | .47 | -.03 | .50 | .04 | .25 | .16 | | |
| | N | 13 | | 4 | | 2 | | | | |
| "Chicano" | Pre | -.91 | 2.54 | .15 | .39 | .54 | .13 | -.07 | i | i* |
| | Post | -.12 | .90 | -.30 | .53 | -.91 | .18 | -.44 | | |
| | N | 14 | | 5 | | 2 | | | | |
| Column Totals | Pre | -.23 | i | -.26 | i | -.20 | i | | | |
| | Post | .11 | | -.15 | | -.84 | | | | |
| | N | 235 | | 39 | | 16 | | | | |
| | $\Delta \bar{X}/SD$ | i* | | i | | -i* | | | | |

## Table 23

## Occupational Cynicism: Ethnicity by Completion

| | | Completion | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Complete Core & Prep. | | Complete Core Only | | Complete Nothing | | Raw Means | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | .05 | .97 | -.02 | .90 | -.05 | .91 | -.01 | i | i |
| | Post | .05 | .94 | -.19 | .71 | .30 | 1.14 | .05 | | |
| | N | 208 | | 30 | | 12 | | | | |
| Indian | Pre | -.18 | 1.36 | -1.08 | 1.34 | -.63 | .60 | -.63 | i | i |
| | Post | .19 | 1.37 | -.48 | .45 | -1.72 | 1.66 | -.67 | | |
| | N | 13 | | 4 | | 2 | | | | |
| "Chicano" | Pre | .08 | 1.29 | -.63 | .57 | -.18 | .94 | -.24 | i | i |
| | Post | -.34 | .91 | .30 | .76 | -.23 | .44 | -.09 | | |
| | N | 14 | | 5 | | 2 | | | | |
| Column Totals | Pre | -.02 | i | .14 | .79 | -.29 | i | | | |
| | Post | -.03 | | -.12 | | -.55 | | | | |
| | N | 235 | | 39 | | 16 | | | | |
| | $\Delta\bar{X}$/SD | i | | -.33* | | i | | | | |

## Table 24

## Occupational Disinterest: Ethnicity by Completion

| | | Completion | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Complete Core & Prep. | | Complete Core Only | | Complete Nothing | | Raw Means | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta \bar{X}/SD$ |
| "White" | Pre | .09 | .87 | -.09 | 1.02 | -.26 | 1.23 | -.09 | i | i |
| | Post | .06 | .86 | .12 | .92 | -.39 | .88 | -.07 | | |
| | N | 208 | | 30 | | 12 | | | | |
| Indian | Pre | -.05 | 1.25 | 1.35 | .60 | -.79 | 2.38 | .17 | i | i |
| | Post | .05 | 1.08 | -.29 | 1.00 | .23 | .72 | .00 | | |
| | N | 13 | | 4 | | 2 | | | | |
| "Chicano" | Pre | .03 | 1.20 | .12 | .74 | .92 | .21 | .36 | i | - i* |
| | Post | -.05 | .96 | -.55 | 1.13 | -.74 | .80 | -.45 | | |
| | N | 14 | | 5 | | 2 | | | | |
| Column Totals | Pre | .02 | i | .46 | i | -.04 | i | | | |
| | Post | .02 | | -.24 | | .19 | | | | |
| | N | 235 | | 39 | | 16 | | | | |
| | $\Delta \bar{X}/SD$ | i | | -i* | | i | | | | |

Table 25

Analysis of Variance for Overall Career Maturity by Ethnicity and Completion

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1,658.10 | 1 | 1,658.10 | 84.18 | <.001 |
| Ethnicity | 152.29 | 2 | 76.14 | 3.87 | .022 |
| Completion Status | 255.25 | 2 | 127.63 | 6.48 | .002 |
| Interaction | 84.80 | 4 | 21.20 | 1.08 | .368 |
| Covariate | 1,112.28 | 1 | 1,112.28 | 56.47 | <.001 |
| Error | 5,515.34 | 280 | 19.70 | ---- | ---- |

Table 26

Analysis of Variance for Vocational Confusion by Ethnicity and Completion

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 5.48 | 1 | 5.48 | 10.29 | .001 |
| Ethnicity | 7.26 | 2 | 3.63 | 6.81 | .001 |
| Completion Status | 8.34 | 2 | 4.18 | 7.85 | <.001 |
| Interaction | 2.74 | 4 | .69 | 1.29 | .275 |
| Covariate | 38.36 | 1 | 28.36 | 53.27 | <.001 |
| Error | 149.07 | 280 | .53 | ---- | ---- |

## Table 27

### Analysis of Variance for Vocational Indifference by Ethnicity and Completion

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 2.21 | 1 | 2.21 | 2.46 | .118 |
| Ethnicity | 4.78 | 2 | 2.39 | 2.65 | .072 |
| Completion Status | 6.92 | 2 | 3.46 | 3.84 | .023 |
| Interaction | 5.81 | 4 | 1.45 | 1.61 | .172 |
| Covariate | 6.81 | 1 | 6.81 | 7.55 | .006 |
| Error | 252.47 | 280 | .90 | ---- | ---- |

## Table 28

### Analysis of Variance for Occupational Cynicism by Ethnicity and Completion

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1.01 | 1 | 1.01 | 1.24 | .267 |
| Ethnicity | 2.62 | 2 | 1.31 | 1.61 | .202 |
| Completion Status | 1.63 | 2 | .82 | 1.00 | .368 |
| Interaction | 10.17 | 4 | 2.54 | 3.13 | .015 |
| Covariate | 26.17 | 1 | 26.17 | 32.18 | <.001 |
| Error | 227.70 | 280 | .81 | ---- | ---- |

Table 29

Analysis of Variance for Occupational Disinterest by Ethnicity and Completion

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 2.82 | 1 | 2.82 | 3.98 | .047 |
| Ethnicity | 2.05 | 2 | 1.03 | 1.45 | .236 |
| Completion Status | 3.44 | 2 | 1.72 | 2.43 | .090 |
| Interaction | 3.32 | 4 | .83 | 1.17 | .324 |
| Covariate | 24.81 | 1 | 24.81 | 35.05 | <.001 |
| Error | 198.17 | 280 | .71 | ---- | ---- |

Table 30

Overall Career Maturity: Ethnicity by Program Period

| | | Program Period | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fall '74 | | Winter '74-75 | | Spring '75 | | Summer '75 | | Fall '75 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}/SD$ |
| "White" | Pre | 35.8 | 5.41 | 36.3 | 4.45 | 36.8 | 4.04 | 36.8 | 4.04 | 36.7 | 4.02 | 36.5 | 4.92 | .26 |
| | Post | 37.7 | 6.04 | 37.7 | 4.18 | 37.4 | 5.78 | 39.0 | 4.74 | 37.0 | 6.55 | 37.8 | | |
| | N | 21 | | 73 | | 61 | | 63 | | 35 | | 253 | | |
| Indian & Chicano | Pre | 32.0 | 3.08 | 32.6 | 6.97 | 34.4 | 3.33 | 34.4 | 5.39 | 29.3 | 5.51 | 32.5 | 4.34 | .74* |
| | Post | 37.4 | 3.44 | 38.3 | 6.41 | 37.6 | 3.72 | 35.7 | 3.97 | 29.3 | 1.53 | 35.7 | | |
| | N | 5 | | 8 | | 16 | | 9 | | 3 | | 41 | | |
| Column Totals (Unweighted) | Pre | 33.9 | 4.49 | 34.5 | 5.50 | 35.6 | 4.22 | 35.6 | 5.55 | 33.0 | 4.40 | | | |
| | Post | 37.6 | | 38.0 | | 37.5 | | 37.4 | | 32.2 | | | | |
| | N | 26 | | 81 | | 77 | | 71 | | 38 | | 294 | | |
| | $\Delta\bar{X}/SD$ | .82* | | .64* | | .21 | | .32 | | .18 | | | | |

## Table 31

### Vocational Confusion: Ethnicity by Program Period

| | | Program Period | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fall '74 | | Winter '74-75 | | Spring '75 | | Summer '75 | | Fall '75 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | .02 | .89 | -.01 | 1.00 | .18 | .97 | .04 | .96 | .14 | .94 | .07 | i | i |
| | Post | .11 | .65 | .02 | .78 | -.06 | .86 | .17 | .66 | -.11 | .99 | .03 | | |
| | N | 21 | | 73 | | 61 | | 63 | | 35 | | 253 | | |
| Indian & Chicano | Pre | .14 | 1.56 | -.27 | .67 | -.09 | .90 | .26 | .89 | .00 | 1.17 | .01 | .99 | -.40* |
| | Post | -.03 | 1.14 | .26 | .49 | .07 | .90 | -.29 | 1.07 | -1.99 | 1.08 | -.40 | | |
| | N | 5 | | 8 | | 16 | | 9 | | 3 | | 41 | | |
| Column Totals (Unweighted) | Pre | .08 | i | -.14 | .74 | .05 | i | .15 | .90 | .07 | 1.05 | | | |
| | Post | .04 | | .22 | | .01 | | -.06 | | -2.10 | | | | |
| | N | 26 | | 81 | | 77 | | 71 | | 38 | | 294 | | |
| | $\Delta\bar{X}$/SD | i | | .47* | | i | | -.23 | | -.207* | | | | |

## Table 32

## Vocational Indifference: Ethnicity by Program Period

| Ethnicity | | Program Period<br>Fall '74 $\bar{X}$ | Fall '74 SD | Winter '74-75 $\bar{X}$ | Winter '74-75 SD | Spring '75 $\bar{X}$ | Spring '75 SD | Summer '75 $\bar{X}$ | Summer '75 SD | Fall '75 $\bar{X}$ | Fall '75 SD | Unweighted Raw Totals $\bar{X}$ | Unweighted Raw Totals SD | Unweighted Raw Totals $\Delta\bar{X}/SD$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "White" | Pre | -.05 | .65 | .18 | .53 | .06 | .49 | .25 | .64 | .28 | .49 | .14 | i | i |
| | Post | -.17 | 1.22 | .12 | .80 | -.10 | 1.35 | .24 | .73 | -.26 | 1.32 | -.03 | | |
| | N | 21 | | 73 | | 61 | | 63 | | 35 | | 253 | | |
| Indian & Chicano | Pre | -.63 | .90 | -1.23 | 3.15 | -.13 | 1.02 | -.24 | .90 | .30 | .42 | -.39 | i | i |
| | Post | .10 | .46 | .13 | 1.16 | -.06 | .57 | .11 | .49 | -.79 | .23 | -.10 | | |
| | N | 5 | | 8 | | 16 | | 9 | | 3 | | 41 | | |
| Column Totals (Unweighted) | Pre | -.34 | .81 | -.53 | 1.41 | -.04 | i | .01 | i | .29 | .64 | | | |
| | Post | -.04 | | .13 | | -.08 | | .18 | | -.53 | | | | |
| | N | 26 | | 81 | | 77 | | 71 | | 38 | | 294 | | |
| | $\Delta\bar{X}/SD$ | .37* | | .47* | | i | | i | | -1.28* | | | | |

### Table 33

### Occupational Cynicism: Ethnicity by Program Period

|  |  | Program Period |  |  |  |  |  |  |  |  |  | Unweighted Raw Totals |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Fall '74 |  | Winter '74-'75 |  | Spring '75 |  | Summer '75 |  | Fall '75 |  |  |  |  |
| Ethnicity |  | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}/SD$ |
| "White" | Pre | .21 | 1.20 | -.01 | .90 | .02 | .92 | .06 | .95 | .08 | 1.02 | .07 | i | i |
|  | Post | .16 | 1.14 | -.17 | .88 | .07 | .99 | .02 | .88 | .27 | .85 | .07 |  |  |
|  | N | 21 |  | 73 |  | 61 |  | 63 |  | 35 |  | 253 |  |  |
| Indian & Chicano | Pre | -1.13 | 1.20 | .67 | 1.89 | -.36 | .88 | -.42 | .58 | -.50 | .86 | -.35 | i | i |
|  | Post | -.24 | .53 | .14 | 1.64 | .02 | 1.03 | -.69 | .99 | -.54 | .62 | -.26 |  |  |
|  | N | 5 |  | 8 |  | 16 |  | 9 |  | 3 |  | 41 |  |  |
| Column Totals (Unweighted) | Pre | -.46 | 1.02 | .33 | 1.33 | -.17 | i | -.18 | i | -.21 | i |  |  |  |
|  | Post | -.04 |  | -.02 |  | .05 |  | -.34 |  | -.14 |  |  |  |  |
|  | N | 26 |  | 81 |  | 77 |  | 71 |  | 38 |  | 294 |  |  |
|  | $\Delta\bar{X}/SD$ | .41* |  | .26 |  | i |  | i |  | i |  |  |  |  |

Table 34

Occupational Disinterest: Ethnicity by Program Period

| | | Program Period | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fall '74 | | Winter '74-75 | | Spring '75 | | Summer '75 | | Fall '75 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}/SD$ |
| "White" | Pre | .12 | 1.09 | .02 | .88 | .31 | .89 | -.08 | .85 | -.08 | .92 | .06 | i | i |
| | Post | .10 | .93 | -.04 | .83 | .17 | .78 | .00 | .71 | -.14 | 1.08 | .02 | | |
| | N | 21 | | 73 | | 61 | | 63 | | 35 | | 253 | | |
| Indian & Chicano | Pre | .41 | 2.06 | -.19 | 1.34 | .12 | .93 | .21 | 1.35 | .64 | .50 | .31 | i | -i* |
| | Post | -.54 | 1.08 | -.21 | .95 | .05 | 1.08 | .00 | .87 | -.45 | .74 | -.23 | | |
| | N | 5 | | 8 | | 16 | | 9 | | 3 | | 41 | | |
| Column Totals (Unweighted) | Pre | .27 | 1.29 | -.09 | i | .10 | i | .07 | i | .28 | .81 | | | |
| | Post | -.27 | | -.13 | | .12 | | .00 | | -.30 | | | | |
| | N | 26 | | 81 | | 77 | | 71 | | 38 | | 294 | | |
| | $\Delta\bar{X}/SD$ | -.42* | | i | | i | | i | | -.72* | | | | |

### Table 35

### Analysis of Variance for Overall Career Maturity by Ethnicity by Program Period

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1,746.54 | 1 | 1,746.54 | 78.85 | <.001 |
| Ethnicity | 1.08 | 1 | 1.08 | .05 | .825 |
| Program Period | 147.75 | 4 | 36.94 | 1.67 | .158 |
| Interaction | 150.51 | 4 | 37.63 | 1.70 | .150 |
| Covariate | 1,250.06 | 1 | 1,250.06 | 56.43 | <.001 |
| Error | 6,268.71 | 283 | 22.15 | ---- | ---- |

### Table 36

### Analysis of Variance for Vocational Confusion by Ethnicity by Program Period

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 4.19 | 1 | 4.19 | 7.56 | .006 |
| Ethnicity | 4.23 | 1 | 4.23 | 7.63 | .006 |
| Program Period | 13.34 | 4 | 3.33 | 6.01 | <.001 |
| Interaction | 12.35 | 4 | 3.09 | 5.57 | <.001 |
| Covariate | 30.06 | 1 | 30.06 | 54.19 | <.001 |
| Error | 156.98 | 283 | .55 | ---- | ---- |

### Table 37

### Analysis of Variance for Vocational Indifference by Ethnicity by Program Period

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .16 | 1 | .16 | .16 | .692 |
| Ethnicity | .09 | 1 | .09 | .09 | .769 |
| Program Period | 6.78 | 4 | 1.70 | 1.69 | .153 |
| Interaction | 2.01 | 4 | .50 | .50 | .735 |
| Covariate | 10.09 | 1 | 10.09 | 10.04 | .002 |
| Error | 284.17 | 283 | 1.00 | ---- | ---- |

### Table 38

### Analysis of Variance for Occupational Cynicism by Ethnicity by Program Period

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .33 | 1 | .33 | .40 | .529 |
| Ethnicity | 1.15 | 1 | 1.15 | 1.39 | .239 |
| Program Period | 3.26 | 4 | .81 | .99 | .415 |
| Interaction | 3.16 | 4 | .79 | .96 | .431 |
| Covariate | 23.85 | 1 | 23.85 | 28.91 | <.001 |
| Error | 233.46 | 283 | .82 | ---- | ---- |

Table 39

Analysis of Variance for Occupational Disinterest by Ethnicity and Program Period

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 2.30 | 1 | 2.30 | 3.22 | .074 |
| Ethnicity | 2.36 | 1 | 2.36 | 3.30 | .070 |
| Program Period | 2.71 | 4 | .68 | .94 | .438 |
| Interaction | 1.78 | 4 | .45 | .62 | .647 |
| Covariate | 22.37 | 1 | 22.37 | 31.24 | <.001 |
| Error | 202.65 | 283 | .72 | ---- | ---- |

## Table 40

## Overall Career Maturity: Sex by Occupational Area

| Sex and Marital Status | | Office | | Lodging | | Food | | Market | | Unweighted Raw Means | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta \bar{X}$/SD |
| Male | Pre | 35.0 | 4.24 | 28.3 | 7.77 | 33.6 | 2.42 | 36.5 | 2.63 | 33.4 | i | i* |
| | Post | 37.5 | 3.53 | 35.3 | 5.69 | 35.3 | 6.28 | 37.3 | 4.39 | 36.4 | | |
| | N | 2 | | 3 | | 6 | | 13 | | 24 | | |
| Single Female | Pre | 37.4 | 3.33 | 43.0 | .00 | 31.0 | 1.73 | 39.0 | 5.66 | 37.6 | i | i* |
| | Post | 38.1 | 6.29 | 45.0 | .00 | 38.3 | 3.21 | 38.5 | 3.54 | 40.0 | | |
| | N | 20 | | 1 | | 3 | | 2 | | 26 | | |
| Married Female | Pre | 37.6 | 3.94 | 36.5 | 4.95 | 32.6 | 3.18 | 33.0 | 3.94 | 34.9 | i | i* |
| | Post | 39.9 | 4.00 | 42.0 | 4.24 | 34.2 | 6.26 | 37.7 | 6.56 | 38.5 | | |
| | N | 44 | | 2 | | 5 | | 9 | | 60 | | |
| Column Means (Unweighted) | Pre | 36.7 | i | 35.9 | i | 32.4 | i | 36.2 | 4.45 | | | |
| | Post | 38.5 | | 40.8 | | 35.9 | | 37.8 | | | | |
| | N | 66 | | 6 | | 14 | | 24 | | | | |
| | $\Delta \bar{X}$/SD | i* | | i* | | i* | | .36* | | | | |

## Table 41

### Vocational Confusion: Sex by Occupational Area

| Sex and Marital Status | | Office | | Lodging | | Food | | Market | | Unweighted Raw Means | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| Male | Pre | .11 | 1.48 | -.57 | 1.84 | .00 | .80 | .35 | 1.29 | -.03 | i | i |
| | Post | .43 | .11 | -.15 | .70 | -.05 | .59 | -.33 | .74 | -.03 | | |
| | N | 2 | | 3 | | 6 | | 13 | | 24 | | |
| Single Female | Pre | -.08 | .96 | .82 | .00 | -1.30 | .93 | .78 | .75 | .07 | .72 | .36* |
| | Post | .33 | .74 | .46 | .00 | -.13 | .71 | .66 | .25 | .33 | | |
| | N | 20 | | 1 | | 3 | | 2 | | 26 | | |
| Married Female | Pre | .23 | .83 | .30 | .00 | -.56 | 1.19 | -.70 | .62 | -.18 | i | i |
| | Post | .30 | .62 | .73 | .17 | -.78 | 1.51 | .15 | .59 | .10 | | |
| | N | 44 | | 2 | | 5 | | 9 | | 60 | | |
| Column Means (Unweighted) | Pre | .09 | .79 | .18 | i | -.62 | .96 | .14 | i | | | |
| | Post | .35 | | .35 | | -.32 | | .16 | | | | |
| | N | 66 | | 6 | | 14 | | 24 | | | | |
| | $\Delta\bar{X}$/SD | .33* | | i | | .31 | | i | | | | |

## Table 42

### Vocational Indifference: Sex by Occupational Area

| Sex and Marital Status | | Office | | Lodging | | Food | | Market | | Unweighted Raw Means | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| Male | Pre | .42 | .16 | .01 | .31 | .06 | .65 | .31 | .32 | .20 | .60 | -.47* |
| | Post | .55 | .04 | -.34 | 1.04 | -.46 | 1.36 | -.05 | .84 | -.08 | | |
| | N | 2 | | 3 | | 6 | | 13 | | 24 | | |
| Single Female | Pre | .17 | .47 | .48 | .00 | -.04 | .76 | .16 | .42 | .19 | i | i |
| | Post | -.19 | 1.10 | .92 | .00 | .20 | .57 | -.10 | .35 | .21 | | |
| | N | 20 | | 1 | | 3 | | 2 | | 26 | | |
| Married Female | Pre | .21 | .57 | -.06 | .07 | .11 | .40 | .47 | .91 | .18 | i | i |
| | Post | .23 | .89 | .42 | .28 | .07 | .80 | .11 | 1.20 | .21 | | |
| | N | 44 | | 2 | | 5 | | 9 | | 60 | | |
| Column Means (Unweighted) | Pre | .27 | i | .14 | .43 | .04 | i | .31 | .67 | | | |
| | Post | .20 | | .33 | | -.06 | | -.01 | | | | |
| | N | 66 | | 6 | | 14 | | 24 | | | | |
| | $\Delta\bar{X}$/SD | i | | .44* | | i | | -.45* | | | | |

## Table 43

### Occupational Cynicism: Sex by Occupational Area

| Sex and Marital Status | | Office | | Lodging | | Food | | Market | | Unweighted Raw Means | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | Δ $\bar{X}$/SD |
| Male | Pre | -.59 | 1.25 | -1.71 | .40 | -.33 | 1.39 | .01 | .82 | -.66 | i | i |
| | Post | .90 | .31 | .36 | 1.44 | -.04 | 1.29 | .25 | 1.19 | .37 | | |
| | N | 2 | | 3 | | 6 | | 13 | | 24 | | |
| Single Female | Pre | .42 | .88 | .54 | .00 | -.18 | .07 | .05 | .42 | .21 | i | i |
| | Post | .19 | 1.07 | .43 | .00 | .17 | .11 | -.42 | .63 | .09 | | |
| | N | 20 | | 1 | | 3 | | 2 | | 26 | | |
| Married Female | Pre | .01 | .99 | -.23 | 1.17 | .07 | 1.69 | .39 | .71 | .06 | i | i |
| | Post | -.06 | .82 | -.20 | .49 | -.41 | .66 | -.36 | .94 | -.26 | | |
| | N | 44 | | 2 | | 5 | | 9 | | 60 | | |
| Column Means (Unweighted) | Pre | -.05 | i | -.47 | | -.15 | i | .15 | i | | | |
| | Post | .34 | | .20 | | -.09 | | -.18 | | | | |
| | N | 66 | | 6 | | 14 | | 24 | | | | |
| | Δ $\bar{X}$/SD | i* | | i* | | i | | i* | | | | |

## Table 44

Occupational Disinterest: Sex by Occupational Area

| Sex and Marital Status | | Office $\bar{X}$ | Office SD | Lodging $\bar{X}$ | Lodging SD | Food $\bar{X}$ | Food SD | Market $\bar{X}$ | Market SD | Unweighted Raw Means $\bar{X}$ | Unweighted Raw Means SD | Unweighted Raw Means $\Delta\bar{X}/SD$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | Pre | -.39 | .20 | -.47 | .94 | .06 | .41 | .39 | .77 | -.10 | i | -i* |
| | Post | -.50 | .86 | -.42 | .97 | -.82 | 1.38 | -.18 | .79 | -.48 | | |
| | N | 2 | | 3 | | 6 | | 13 | | 24 | | |
| Single Female | Pre | .12 | .94 | .11 | .00 | .18 | 1.06 | -.11 | .37 | .08 | i | i |
| | Post | .16 | .67 | .11 | .00 | -.27 | .07 | .94 | .18 | .24 | | |
| | N | 20 | | 1 | | 3 | | 2 | | 26 | | |
| Married Female | Pre | .28 | .86 | 1.24 | .50 | -.20 | .70 | -.45 | 1.66 | .22 | i | i |
| | Post | .44 | .62 | .84 | .14 | -.58 | .50 | -.04 | .95 | .17 | | |
| | N | 44 | | 2 | | 5 | | 9 | | 60 | | |
| Column Means (Unweighted) | Pre | .00 | i | .29 | i | .01 | i | -.06 | i | | | |
| | Post | .03 | | .18 | | -.56 | | .24 | | | | |
| | N | 66 | | 6 | | 14 | | 24 | | | | |
| | $\Delta\bar{X}/SD$ | i | | i | | -i* | | i | | | | |

Table 45

Analysis of Variance for Overall Career Maturity:
Occupational Area by Sex

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 569.67 | 1 | 569.67 | 24.67 | <.001 |
| Occupational Area | 41.51 | 3 | 13.84 | .60 | .617 |
| Sex & Marital Status | 22.20 | 2 | 11.10 | .48 | .620 |
| Interaction | 76.95 | 6 | 12.82 | .56 | .765 |
| Covariate | 254.33 | 1 | 254.33 | 11.01 | .001 |
| Error | 2,239.88 | 97 | 23.09 | ---- | ---- |

Table 46

Analysis of Variance for Vocational Confusion:
Occupational Area by Sex

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .82 | 1 | .82 | 1.77 | .186 |
| Occupational Area | 1.97 | 3 | .66 | 1.43 | .239 |
| Sex & Marital Status | .63 | 2 | .31 | .68 | .508 |
| Interaction | 4.06 | 6 | .68 | 1.47 | .196 |
| Covariate | 4.52 | 1 | 4.52 | 9.82 | .002 |
| Error | 44.67 | 97 | .46 | ---- | ---- |

Table 47

Analysis of Variance for Vocational Indifference:
Occupational Area by Sex

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .08 | 1 | .08 | .09 | .760 |
| Occupational Area | .64 | 3 | .21 | .24 | .869 |
| Sex & Marital Status | 1.01 | 2 | .50 | .57 | .570 |
| Interaction | 2.53 | 6 | .42 | .47 | .826 |
| Covariate | 5.42 | 1 | 5.42 | 6.08 | .015 |
| Error | 86.35 | 97 | .89 | | |

Table 48

Analysis of Variance for Occupational Cynicism:
Occupational Area by Sex

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .11 | 1 | .11 | .12 | .730 |
| Occupational Area | 1.27 | 3 | .42 | .48 | .696 |
| Sex & Marital Status | 1.11 | 2 | .56 | .63 | .532 |
| Interaction | 3.75 | 6 | .63 | .71 | .640 |
| Covariate | 4.83 | 1 | 4.83 | 5.50 | .021 |
| Error | 85.14 | 97 | .88 | ---- | ---- |

## Table 49

## Analysis of Variance for Occupational Disinterest: Occupational Area by Sex

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .05 | 1 | .05 | .10 | .746 |
| Occupational Area | 4.73 | 3 | 1.58 | 3.03 | .033 |
| Sex & Marital Status | 3.74 | 2 | 1.87 | 3.59 | .031 |
| Interaction | 2.56 | 6 | .43 | .82 | .556 |
| Covariate | 2.57 | 1 | 2.57 | 4.93 | .029 |
| Error | 50.47 | 97 | .52 | ---- | ---- |

## Table 50

### Overall Career Maturity: Ethnicity by Counselor

| | | Counselor | | | | | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 8 | | 10 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | 36.1 | 3.55 | 36.6 | 4.39 | 36.1 | 4.33 | 36.9 | 4.42 | 36.5 | 4.15 | 39.3 | 3.40 | 36.7 | 3.95 | Previously Established | | |
| | Post | 37.2 | 5.69 | 37.0 | 5.89 | 39.0 | 4.30 | 38.6 | 5.36 | 37.1 | 2.91 | 37.8 | 5.56 | 39.0 | 5.77 | | | |
| | N | 25 | | 87 | | 45 | | 53 | | 14 | | 4 | | 7 | | | | |
| Indian & Chicano | Pre | 40.0 | .00 | 32.1 | 4.64 | 32.3 | 5.68 | 34.9 | 4.93 | 34.0 | .00 | 34.0 | 2.00 | 35.0 | 2.83 | Previously Established | | |
| | Post | 48.0 | .00 | 35.3 | 4.87 | 37.5 | 4.61 | 35.6 | 3.47 | 34.0 | .00 | 36.0 | 4.00 | 42.0 | 4.24 | | | |
| | N | 1 | | 12 | | 11 | | 11 | | 1 | | 3 | | 2 | | | | |
| Column Totals (Unweighted) | Pre | Not using unweighted analysis--Only one minority student. No gain with "White." | | 34.4 | 4.95 | 34.2 | i | 35.9 | 4.55 | Not using unweighted analysis--Only one minority student. No gain with "White". | | 36.7 | i | 35.9 | i | | | |
| | Post | | | 36.1 | | 38.3 | | 37.1 | | | | 36.9 | | 40.5 | | | | |
| | N | | | 99 | | 56 | | 64 | | | | 7 | | 9 | | | | |
| | $\Delta\bar{X}$/SD | | | .34* | | i* | | .26 | | | | i | | i* | | | | |

## Table 51

## Vocational Confusion: Ethnicity by Counselor

| | | Counselor | | | | | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 8 | | 10 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | .32 | .89 | .10 | .98 | -.18 | .89 | .02 | 1.01 | -.12 | 1.02 | .75 | 1.17 | .37 | 1.08 | Previously Established | | |
| | Post | .20 | .75 | -.19 | .96 | .12 | .58 | .11 | .74 | .09 | .54 | .40 | 1.01 | .16 | .59 | | | |
| | N | 25 | | 87 | | 45 | | 53 | | 14 | | 4 | | 7 | | | | |
| Indian & Chicano | Pre | -.25 | .00 | .33 | .78 | -.45 | 1.02 | .05 | 1.13 | -.70 | .00 | .42 | .48 | -.23 | .74 | Previously Established | | |
| | Post | .59 | .00 | -.27 | 1.25 | .13 | .80 | -.56 | 1.12 | -.30 | .00 | .18 | .47 | .75 | .13 | | | |
| | N | 1 | | 12 | | 11 | | 11 | | 1 | | 3 | | 2 | | | | |
| Column Totals (Unweighted) | Pre | Too few minority clients to be valid. No Gain "White." | | .22 | i | -.32 | i | .04 | i | Too few minority clients for valid conclusion. No Gain "White." | | .54 | .78 | .07 | i | | | |
| | Post | | | -.23 | | .13 | | -.23 | | | | .29 | | .46 | | | | |
| | N | | | 99 | | 56 | | 64 | | | | 7 | | 9 | | | | |
| | $\Delta\bar{X}$/SD | | | -i* | | i* | | i | | | | -.32 | | i* | | | | |

5

## Table 52

## Vocational Indifference: Ethnicity by Counselor

| | | Counselor | | | | | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 8 | | 10 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | Δ$\bar{X}$/SD |
| "White" | Pre | .16 | .49 | .16 | .59 | .22 | .47 | .12 | .72 | .18 | .30 | .33 | .12 | .15 | .48 | Previously Established | | |
| | Post | -.13 | 1.38 | -.07 | 1.16 | .23 | .70 | .03 | 1.11 | .06 | .84 | .25 | .75 | .14 | .55 | | | |
| | N | 25 | | 87 | | 45 | | 53 | | 14 | | 4 | | 7 | | | | |
| Indian & Chicano | Pre | .34 | .00 | -.50 | 1.00 | -1.17 | 2.77 | .16 | .56 | .61 | .00 | -.16 | .30 | .16 | .40 | Previously Established | | |
| | Post | .16 | .00 | -1.15 | .51 | .06 | 1.03 | -.08 | .57 | -.66 | .00 | .23 | .82 | .43 | .30 | | | |
| | N | 1 | | 12 | | 11 | | 11 | | 1 | | 3 | | 2 | | | | |
| Column Totals (Unweighted) | Pre | Too few minority clients to be valid. No change with "White." | | -.17 | i | -.48 | i | .14 | i | Too few minority clients to be valid. No change with "White." | | .09 | i | .16 | j | | | |
| | Post | | | -.61 | | .15 | | -.03 | | | | .24 | | .39 | | | | |
| | N | | | 99 | | 56 | | 64 | | | | 7 | | 9 | | | | |
| | Δ$\bar{X}$/SD | | | -i* | | i* | | i | | | | i | | i* | | | | |

## Table 53

### Occupational Cynicism: Ethnicity by Counselor

| | | Counselor | | | | | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 8 | | 10 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| "White" | Pre | .40 | .76 | .18 | .98 | .12 | 1.02 | .05 | .87 | .12 | 1.11 | -.01 | .73 | -.54 | .92 | Previously | | |
| | Post | -.02 | 1.01 | .12 | 1.01 | -.01 | .92 | .04 | .82 | -.25 | 1.23 | -.14 | .46 | .06 | .58 | Established | | |
| | N | 25 | | 87 | | 45 | | 53 | | 14 | | 4 | | 7 | | | | |
| Indian & Chicano | Pre | 2.81 | .00 | -.28 | 1.16 | .21 | 1.48 | -.66 | .63 | -1.11 | .00 | -1.01 | .53 | -.85 | .29 | Previously | | |
| | Post | 2.85 | .00 | -.48 | 1.33 | -.31 | 1.06 | .07 | .67 | .02 | .00 | -.58 | .89 | -.19 | .50 | Established | | |
| | N | 1 | | 12 | | 11 | | 11 | | 1 | | 3 | | 2 | | | | |
| Column Totals (Unweighted) | Pre | Too few | | -.05 | i | .17 | 1.12 | -.31 | i | Too few | | -.51 | .65 | -.70 | i | | | |
| | Post | minority. | | -.18 | | -.16 | | .06 | | minority. | | -.31 | | -.07 | | | | |
| | N | Loss with | | 99 | | 56 | | 64 | | Marginal loss | | 7 | | 9 | | | | |
| | $\Delta\bar{X}$/SD | "White." | | i | | .29 | | i* | | with "White." | | .31 | | i* | | | | |

## Table 54

### Occupational Disinterest: Ethnicity by Counselor

| | | Counselor | | | | | | | | | | | | | | Unweighted Raw Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 8 | | 10 | | | | |
| Ethnicity | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\Delta\bar{X}$/SD |
| ...te" | Pre | .02 | .66 | -.05 | .94 | .15 | .88 | .05 | 1.01 | .21 | .74 | .21 | .30 | .48 | .72 | Previously | | |
| | Post | -.13 | .90 | -.03 | .88 | .11 | .88 | .19 | .69 | .11 | .98 | -.88 | 1.24 | .00 | 1.29 | Established | | |
| | N | 25 | | 87 | | 45 | | 53 | | 14 | | 4 | | 7 | | | | |
| | Pre | -.53 | .00 | .03 | 1.68 | .29 | 1.28 | -.03 | .57 | .58 | .00 | .19 | .99 | 1.18 | .41 | Previously | | |
| | Post | 1.06 | .00 | .02 | 1.15 | -.16 | .88 | -.29 | .93 | -1.17 | .00 | -.58 | .82 | .81 | .10 | Established | | |
| ...ano | N | 1 | | 12 | | 11 | | 11 | | 1 | | 3 | | 2 | | | | |
| Column | Pre | Too few | | -.01 | i | .18 | i | .01 | i | Too few | | .20 | i | .83 | i | | | |
| ...als | Post | minority. | | -.01 | | -.03 | | -.05 | | minority. | | -.73 | | .41 | | | | |
| | N | No change | | 99 | | 56 | | 64 | | No change | | 7 | | 9 | | | | |
| ...ghted) | $\Delta\bar{X}$/SD | with "White." | | i | | i | | i | | with "White." | | -i* | | -i* | | | | |

## Table 55

### Analysis of Variance for Overall Career Maturity: Ethnic Group by Counselor

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | 1,479.38 | 1 | 1,479.38 | 65.97 | <.001 |
| Ethnicity | 31.00 | 1 | 31.00 | 1.38 | .241 |
| Counselor | 239.14 | 6 | 39.86 | 1.78 | .104 |
| Interaction | 142.73 | 6 | 23.79 | 1.06 | .387 |
| Covariate | 1,255.72 | 1 | 1,255.72 | 56.00 | <.001 |
| Error | 5,853.05 | 261 | 22.43 | ---- | ---- |

## Table 56

### Analysis of Variance for Vocational Confusion: Ethnic Group by Counselor

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .44 | 1 | .44 | .75 | .387 |
| Ethnicity | .03 | 1 | .03 | .05 | .822 |
| Counselor | 9.01 | 6 | 1.50 | 2.55 | .020 |
| Interaction | 4.98 | 6 | .83 | 1.41 | .212 |
| Covariate | 27.82 | 1 | 27.82 | 47.20 | <.001 |
| Error | 153.81 | 261 | .59 | ---- | ---- |

## Table 57

## Analysis of Variance for Vocational Indifference: Ethnic Group by Counselor

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .03 | 1 | .03 | .03 | .867 |
| Ethnicity | .00 | 1 | .00 | .00 | .970 |
| Counselor | 3.61 | 6 | .60 | .58 | .742 |
| Interaction | 1.15 | 6 | .19 | .19 | .981 |
| Covariate | 8.76 | 1 | 8.76 | 8.51 | .004 |
| Error | 268.60 | 261 | 1.03 | ---- | ---- |

## Table 58

## Analysis of Variance for Occupational Cynicism: Ethnic Group by Counselor

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .71 | 1 | .71 | .85 | .357 |
| Ethnicity | .79 | 1 | .79 | .94 | .333 |
| Counselor | 7.92 | 6 | 1.32 | 1.58 | .154 |
| Interaction | 6.98 | 6 | 1.16 | 1.39 | .219 |
| Covariate | 25.42 | 1 | 25.42 | 30.36 | <.001 |
| Error | 218.52 | 261 | .84 | ---- | ---- |

## Table 59

## Analysis of Variance for Occupational Disinterest: Ethnic Group by Counselor

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Mean | .80 | 1 | .80 | 1.12 | .290 |
| Ethnicity | .01 | 1 | .01 | .01 | .928 |
| Counselor | 6.71 | 6 | 1.12 | 1.57 | .156 |
| Interaction | 6.24 | 6 | 1.04 | 1.46 | .192 |
| Covariate | 18.68 | 1 | 18.68 | 26.22 | <.001 |
| Error | 185.96 | 261 | .71 | ---- | ---- |

## Table 60

## Summary of CMI Analysis by Item

| All | Male | Married Female | Single Female | CMI Item |
|---|---|---|---|---|
| o | o | + | o | Once you choose a job, you can't choose another one. |
| o | o | o | o | In order to choose a job, you need to know what kind of person you are. |
| o | o | o | o | I plan to follow the line of work my parents suggest. |
| o | o | o | o | I guess everybody has to go to work sooner or later, but I don't look forward to it. |
| o | o | o | o | A person can do any kind of work he wants as long as he tries hard. |
| - | - | - | o | I'm not going to worry about choosing an occupation until I'm out of school. |
| o | - | o | o | Your job is important because it determines how much you can earn. |
| - | - | - | o | Work is worthwhile mainly because it lets you buy the things you want. |
| o | o | o | o | The greatest appeal of a job to me is the opportunity it provides for getting ahead. |
| + | + | + | + | I often daydream about what I want to be, but I really haven't chosen a line of work yet. |
| o | o | o | o | Knowing what you are good at is more important than knowing what you like in choosing an occupation. |

Table 60 (Continued)

Summary of CMI Analysis by Item

| All | Male | Married Female | Single Female | CMI Item |
|---|---|---|---|---|
| o | o | o | o | Your parents probably know better than anybody else which occupation you should enter. |
| o | o | o | o | If I can just help others in my work, I'll be happy. |
| o | o | o | o | Work is dull and unpleasant. |
| + | + | + | + | Everyone seems to tell me something different; as a result I don't know which kind of work to choose. |
| + | + | + | + | I don't know how to go about getting into the kind of work I want to do. |
| o | o | o | o | There is no point deciding on a job when the future is so uncertain. |
| + | + | + | o | I spend a lot of time wishing I could do work I know I can never do. |
| + | + | + | + | I don't know what courses I should take in school. |
| - | - | o | o | It's probably just as easy to be successful in one occupation as it is in another. |
| - | o | o | o | By the time youare 15, you should have your mind pretty well made up about the occupation you intend to enter. |

Table 60 (Continued)

Summary of CMI Analysis by Item

| All | Male | Married Female | Single Female | CMI Item |
|---|---|---|---|---|
| - | - | - | - | There are so many things to consider in choosing an occupation, it is hard to make a decision. |
| - | o | - | - | I seldom think about the job I want to enter. |
| - | - | o | o | It doesn't matter which job you choose as long as it pays well. |
| o | o | + | o | You can't go very far wrong by following your parents' advice about which job to choose. |
| o | - | o | o | Working is much like going to school. |
| + | + | + | + | I am having difficulty in preparing myself for the work I want to do. |
| + | + | + | + | I know very little about the requirements of jobs. |
| o | o | o | o | The job I choose has to give me plenty of freedom to do what I want. |
| o | o | o | o | The best thing to do is to try out several jobs, and then choose the one you like best. |
| o | o | o | o | There is only one occupation for each person. |
| o | o | o | o | Whether you are interested in a particular kind of work is not as important as whether you can do it. |

Table 60 (Continued)

Summary of CMI Analysis by Item

| All | Male | Married Female | Single Female | CMI Item |
|---|---|---|---|---|
| + | o | + | o | I can't understand how some people can be so certain about what they want to do. |
| - | o | - | o | As long as I can remember, I've known what kind of work I want to do. |
| + | + | o | o | I want to really accomplish something in my work--to make a great discovery or earn a lot of money or help a great number of people. |
| o | o | o | o | You get into an occupation mostly by chance. |
| - | - | o | o | It's who you know, not what you know, that's important in a job. |
| + | + | + | o | When it comes to choosing a job, I'll make up my own mind. |
| o | + | o | o | You should choose an occupation which gives you a chance to help others. |
| + | + | + | o | When I am trying to study, I often find myself daydreaming about what it will be like when I start working. |
| o | o | + | o | I have little or no idea of what working will be like. |
| - | o | o | o | You should choose an occupation, then plan how to enter it. |
| o | o | + | + | I really can't find any work that has much appeal to me. |
| - | o | o | o | You should choose a job in which you can someday become famous. |

Table 60 (Continued)

Summary of CMI Analysis by Item

| All | Male | Married Female | Single Female | CMI Item |
|---|---|---|---|---|
| o | o | o | o | If you have some doubts about what you want to do, ask your parents or friends for advice and suggestions. |
| - | o | - | - | You should choose a job which allows you to do what you believe in. |
| o | o | o | o | The most important part of work is the pleasure which comes from doing it. |
| + | + | + | + | I keep changing my occupational choice. |
| o | o | o | o | As far as choosing an occupation is concerned, something will come along sooner or later. |
| - | - | o | o | I am not going to worry about choosing a job since you don't have anything to say about it anyway. |

## Table 61

## CMI Items: All Students

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 1 | 1.051 | 432 | 1.910 | 1.928 | .295 | .258 |
| 2 | .000 | 432 | 1.097 | 1.097 | .296 | .296 |
| 3 | .000 | 432 | 1.977 | 1.977 | .150 | .150 |
| 4 | -.452 | 432 | 1.898 | 1.889 | .302 | .314 |
| 5 | .415 | 432 | 1.370 | 1.381 | .483 | .486 |
| 6 | -2.679 | 432 | 1.954 | 1.910 | .210 | .287 |
| 7 | -1.425 | 432 | 1.370 | 1.328 | .483 | .470 |
| 8 | -2.177 | 432 | 1.545 | 1.478 | .499 | .500 |
| 9 | .097 | 432 | 1.199 | 1.201 | .399 | .407 |
| 10 | 9.409 | 432 | 1.390 | 1.684 | .498 | .471 |
| 11 | -.151 | 432 | 1.515 | 1.510 | .500 | .505 |
| 12 | -1.043 | 432 | 1.979 | 1.968 | .143 | .177 |
| 13 | .159 | 432 | 1.351 | 1.356 | .478 | .479 |
| 14 | -.949 | 432 | 1.947 | 1.933 | .244 | .250 |
| 15 | 5.387 | 432 | 1.633 | 1.783 | .483 | .413 |
| 16 | 7.974 | 432 | 1.538 | 1.769 | .499 | .422 |
| 17 | -.149 | 432 | 1.945 | 1.942 | .229 | .234 |
| 18 | 3.055 | 432 | 1.755 | 1.831 | .430 | .375 |
| 19 | 10.503 | 432 | 1.416 | 1.730 | .493 | .445 |
| 20 | -2.036 | 432 | 1.709 | 1.654 | .455 | .476 |
| 21 | -1.807 | 432 | 1.861 | 1.822 | .346 | .383 |
| 22 | 6.815 | 432 | 1.099 | 1.256 | .299 | .437 |
| 23 | -3.051 | 432 | 1.933 | 1.873 | .250 | .333 |
| 24 | -3.959 | 432 | 1.972 | 1.917 | .164 | .276 |
| 25 | 1.133 | 432 | 1.880 | 1.903 | .325 | .304 |
| 26 | -1.228 | 432 | 1.473 | 1.436 | .500 | .506 |
| 27 | 6.598 | 432 | 1.538 | 1.732 | .504 | .449 |
| 28 | 6.006 | 432 | 1.513 | 1.695 | .505 | .461 |
| 29 | .231 | 432 | 1.624 | 1.630 | .490 | .483 |
| 30 | 1.301 | 432 | 1.573 | 1.612 | .495 | .493 |

Table 61 (Continued)

CMI Items: All Students

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 31 | -.930 | 432 | 1.917 | 1.898 | .276 | .317 |
| 32 | .000 | 432 | 1.605 | 1.605 | .494 | .489 |
| 33 | 2.252 | 432 | 1.635 | 1.700 | .482 | .459 |
| 34 | -2.498 | 432 | 1.771 | 1.702 | .420 | .458 |
| 35 | 3.995 | 432 | 1.109 | 1.192 | .311 | .394 |
| 36 | -1.568 | 432 | 1.915 | 1.885 | .288 | .320 |
| 37 | -3.022 | 432 | 1.942 | 1.889 | .243 | .322 |
| 38 | -2.873 | 432 | 1.136 | 1.079 | .343 | .269 |
| 39 | 1.309 | 432 | 1.439 | 1.478 | .497 | .500 |
| 40 | 3.512 | 432 | 1.374 | 1.480 | .484 | .500 |
| 41 | .830 | 432 | 1.889 | 1.905 | .314 | .301 |
| 42 | 2.407 | 432 | 1.074 | 1.118 | .262 | .323 |
| 43 | 1.163 | 432 | 1.871 | 1.894 | .336 | .308 |
| 44 | -2.426 | 432 | 1.956 | 1.919 | .205 | .273 |
| 45 | -.700 | 432 | 1.386 | 1.365 | .497 | .482 |
| 46 | 2.187 | 432 | 1.055 | 1.092 | .229 | .290 |
| 47 | 1.526 | 432 | 1.072 | 1.099 | .258 | .307 |
| 48 | 4.405 | 432 | 1.711 | 1.824 | .454 | .381 |
| 49 | 1.045 | 432 | 1.697 | 1.725 | .460 | .452 |
| 50 | -2.372 | 432 | 1.949 | 1.912 | .220 | .283 |

Table 62

CMI Items: Males

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 1 | -.192 | 186 | 1.914 | 1.909 | .280 | .288 |
| 2 | .000 | 186 | 1.118 | 1.118 | .323 | .323 |
| 3 | .333 | 186 | 1.973 | 1.979 | .162 | .145 |
| 4 | .160 | 186 | 1.882 | 1.888 | .323 | .317 |
| 5 | .000 | 186 | 1.332 | 1.332 | .472 | .472 |
| 6 | -1.976 | 186 | 1.957 | 1.904 | .203 | .296 |
| 7 | -1.952 | 186 | 1.390 | 1.299 | .489 | .459 |
| 8 | -2.105 | 186 | 1.529 | 1.428 | .500 | .496 |
| 9 | .288 | 186 | 1.193 | 1.203 | .395 | .417 |
| 10 | 5.675 | 186 | 1.444 | 1.706 | .498 | .468 |
| 11 | -.458 | 186 | 1.481 | 1.460 | .501 | .510 |
| 12 | -.904 | 186 | 1.979 | 1.963 | .145 | .190 |
| 13 | .842 | 186 | 1.385 | 1.422 | .488 | .495 |
| 14 | -1.043 | 186 | 1.930 | 1.904 | .275 | .296 |
| 15 | 2.646 | 186 | 1.642 | 1.754 | .481 | .432 |
| 16 | 5.406 | 186 | 1.497 | 1.749 | .501 | .435 |
| 17 | -.425 | 186 | 1.941 | 1.930 | .236 | .255 |
| 18 | 2.199 | 186 | 1.722 | 1.813 | .449 | .391 |
| 19 | 6.813 | 186 | 1.455 | 1.759 | .499 | .429 |
| 20 | -1.731 | 186 | 1.684 | 1.615 | .466 | .488 |
| 21 | -1.184 | 186 | 1.861 | 1.824 | .347 | .382 |
| 22 | 5.258 | 186 | 1.102 | 1.278 | .303 | .449 |
| 23 | -1.517 | 186 | 1.941 | 1.898 | .236 | .303 |
| 24 | -3.513 | 186 | 1.973 | 1.888 | .162 | .317 |
| 25 | -.870 | 186 | 1.888 | 1.861 | .317 | .362 |
| 26 | -2.353 | 186 | 1.492 | 1.385 | .501 | .509 |
| 27 | 3.748 | 186 | 1.556 | 1.727 | .498 | .458 |
| 28 | 3.847 | 186 | 1.535 | 1.711 | .500 | .454 |
| 29 | 1.224 | 186 | 1.487 | 1.545 | .501 | .499 |
| 30 | .883 | 186 | 1.540 | 1.583 | .500 | .494 |

## Table 62 (Continued)

### CMI Items: Males

| Item | T-Test | DF | $\overline{X}$ Pre | $\overline{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 31 | -1.000 | 186 | 1.909 | 1.877 | .288 | .360 |
| 32 | -.470 | 186 | 1.631 | 1.610 | .484 | .489 |
| 33 | -.242 | 186 | 1.647 | 1.636 | .479 | .482 |
| 34 | -1.316 | 186 | 1.775 | 1.722 | .418 | .449 |
| 35 | 4.172 | 186 | 1.102 | 1.230 | .303 | .422 |
| 36 | -.685 | 186 | 1.914 | 1.893 | .299 | .310 |
| 37 | -2.595 | 186 | 1.941 | 1.866 | .258 | .357 |
| 38 | -1.675 | 186 | 1.134 | 1.080 | .341 | .272 |
| 39 | -2.205 | 186 | 1.406 | 1.503 | .492 | .501 |
| 40 | 3.362 | 186 | 1.364 | 1.524 | .482 | .501 |
| 41 | -.898 | 186 | 1.930 | 1.904 | .255 | .296 |
| 42 | 1.404 | 186 | 1.075 | 1.112 | .264 | .317 |
| 43 | -1.259 | 186 | 1.893 | 1.856 | .310 | .352 |
| 44 | -1.281 | 186 | 1.941 | 1.909 | .236 | .288 |
| 45 | -.629 | 186 | 1.337 | 1.310 | .485 | .464 |
| 46 | .179 | 186 | 1.086 | 1.091 | .280 | .288 |
| 47 | 1.350 | 186 | 1.064 | 1.102 | .246 | .320 |
| 48 | 1.956 | 186 | 1.679 | 1.754 | .468 | .432 |
| 49 | -.126 | 186 | 1.668 | 1.663 | .472 | .485 |
| 50 | -2.153 | 186 | 1.963 | 1.909 | .190 | .288 |

### Table 63

### CMI Items: Married Females

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 1 | 1.811 | 185 | 1.898 | 1.946 | .321 | .226 |
| 2 | -.185 | 185 | 1.091 | 1.086 | .289 | .281 |
| 3 | -.446 | 185 | 1.984 | 1.978 | .126 | .145 |
| 4 | -.364 | 185 | 1.898 | 1.887 | .304 | .317 |
| 5 | .673 | 185 | 1.392 | 1.419 | .490 | .495 |
| 6 | -2.083 | 185 | 1.952 | 1.903 | .215 | .296 |
| 7 | .000 | 185 | 1.344 | 1.344 | .476 | .476 |
| 8 | -1.899 | 185 | 1.559 | 1.473 | .498 | .501 |
| 9 | -.160 | 185 | 1.199 | 1.194 | .400 | .396 |
| 10 | 6.359 | 185 | 1.333 | 1.634 | .484 | .483 |
| 11 | -.458 | 185 | 1.554 | 1.532 | .498 | .500 |
| 12 | -.333 | 185 | 1.978 | 1.973 | .145 | .162 |
| 13 | -.477 | 185 | 1.296 | 1.274 | .458 | .447 |
| 14 | -.774 | 185 | 1.962 | 1.946 | .217 | .226 |
| 15 | 3.337 | 185 | 1.661 | 1.801 | .475 | .400 |
| 16 | 5.071 | 185 | 1.554 | 1.763 | .498 | .426 |
| 17 | .000 | 185 | 1.941 | 1.941 | .237 | .237 |
| 18 | 1.998 | 185 | 1.774 | 1.844 | .419 | .364 |
| 19 | 6.921 | 185 | 1.387 | 1.704 | .488 | .458 |
| 20 | -1.051 | 185 | 1.720 | 1.677 | .450 | .469 |
| 21 | -.780 | 185 | 1.855 | 1.828 | .353 | .378 |
| 22 | 3.774 | 185 | 1.081 | 1.215 | .273 | .412 |
| 23 | -2.016 | 185 | 1.919 | 1.855 | .273 | .353 |
| 24 | -1.512 | 185 | 1.968 | 1.941 | .177 | .237 |
| 25 | 2.573 | 185 | 1.860 | 1.941 | .348 | .237 |
| 26 | .477 | 185 | 1.441 | 1.462 | .498 | .500 |
| 27 | 4.422 | 185 | 1.543 | 1.742 | .499 | .439 |
| 28 | 4.096 | 185 | 1.478 | 1.667 | .501 | .473 |
| 29 | -1.368 | 185 | 1.731 | 1.672 | .445 | .471 |
| 30 | .761 | 185 | 1.586 | 1.618 | .494 | .487 |

Table 63 (Continued)

CMI Items: Married Females

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 31 | .001 | 185 | 1.909 | 1.909 | .289 | .289 |
| 32 | .441 | 185 | 1.565 | 1.586 | .508 | .494 |
| 33 | 2.090 | 185 | 1.618 | 1.742 | .487 | .439 |
| 34 | -2.275 | 185 | 1.769 | 1.672 | .423 | .471 |
| 35 | 1.418 | 185 | 1.097 | 1.140 | .296 | .348 |
| 36 | -1.640 | 185 | 1.919 | 1.876 | .273 | .330 |
| 37 | -1.092 | 185 | 1.941 | 1.914 | .237 | .281 |
| 38 | -2.060 | 185 | 1.134 | 1.075 | .342 | .265 |
| 39 | -.883 | 185 | 1.457 | 1.414 | .499 | .494 |
| 40 | 1.706 | 185 | 1.398 | 1.473 | .491 | .501 |
| 41 | 1.872 | 185 | 1.844 | 1.903 | .364 | .314 |
| 42 | 1.465 | 185 | 1.081 | 1.124 | .273 | .330 |
| 43 | 2.076 | 185 | 1.844 | 1.909 | .364 | .289 |
| 44 | -1.610 | 185 | 1.968 | 1.935 | .177 | .246 |
| 45 | -.446 | 185 | 1.435 | 1.414 | .508 | .494 |
| 46 | 2.561 | 185 | 1.032 | 1.091 | .177 | .289 |
| 47 | 1.000 | 185 | 1.075 | 1.102 | .265 | .304 |
| 48 | 3.291 | 185 | 1.747 | 1.876 | .436 | .330 |
| 49 | 1.110 | 185 | 1.710 | 1.753 | .455 | .433 |
| 50 | -1.613 | 185 | 1.935 | 1.898 | .246 | .304 |

## Table 64

### CMI Items: Single Females

| Item | T-Test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 1 | .000 | 59 | 1.933 | 1.933 | .252 | .252 |
| 2 | .375 | 59 | 1.050 | 1.067 | .220 | .252 |
| 3 | .000 | 59 | 1.967 | 1.967 | .181 | .181 |
| 4 | -1.000 | 59 | 1.950 | 1.900 | .220 | .303 |
| 5 | .000 | 59 | 1.417 | 1.417 | .497 | .497 |
| 6 | .000 | 59 | 1.950 | 1.950 | .220 | .220 |
| 7 | -.216 | 59 | 1.383 | 1.367 | .490 | .486 |
| 8 | 1.230 | 59 | 1.550 | 1.650 | .502 | .481 |
| 9 | .000 | 59 | 1.217 | 1.217 | .415 | .415 |
| 10 | 3.987 | 59 | 1.400 | 1.767 | .527 | .427 |
| 11 | 1.230 | 59 | 1.500 | 1.600 | .504 | .494 |
| 12 | -.574 | 59 | 1.983 | 1.967 | .129 | .181 |
| 13 | -.228 | 59 | 1.417 | 1.400 | .497 | .494 |
| 14 | 1.426 | 59 | 1.950 | 1.983 | .220 | .129 |
| 15 | 3.933 | 59 | 1.517 | 1.817 | .504 | .390 |
| 16 | 2.912 | 59 | 1.617 | 1.850 | .490 | .360 |
| 17 | .574 | 59 | 1.967 | 1.983 | .181 | .129 |
| 18 | .785 | 59 | 1.800 | 1.850 | .403 | .360 |
| 19 | 3.940 | 59 | 1.383 | 1.717 | .490 | .454 |
| 20 | -.597 | 59 | 1.750 | 1.700 | .437 | .462 |
| 21 | -1.398 | 59 | 1.883 | 1.800 | .324 | .403 |
| 22 | 2.454 | 59 | 1.150 | 1.317 | .360 | .469 |
| 23 | -1.941 | 59 | 1.950 | 1.850 | .220 | .360 |
| 24 | -1.351 | 59 | 1.983 | 1.933 | .129 | .252 |
| 25 | .000 | 59 | 1.917 | 1.917 | .279 | .279 |
| 26 | .000 | 59 | 1.517 | 1.517 | .504 | .504 |
| 27 | 3.350 | 59 | 1.467 | 1.717 | .536 | .454 |
| 28 | 2.182 | 59 | 1.550 | 1.733 | .534 | .446 |
| 29 | .622 | 59 | 1.717 | 1.767 | .490 | .427 |
| 30 | .574 | 59 | 1.633 | 1.683 | .486 | .504 |

Table 64 (Continued)

CMI Items: Single Females

| Item | T-Test | DF | $\overline{X}$ Pre | $\overline{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| 31 | -.814 | 59 | 1.967 | 1.933 | .181 | .252 |
| 32 | .000 | 59 | 1.650 | 1.650 | .481 | .481 |
| 33 | 1.474 | 59 | 1.650 | 1.767 | .481 | .427 |
| 34 | -.405 | 59 | 1.767 | 1.733 | .427 | .446 |
| 35 | 1.000 | 59 | 1.167 | 1.233 | .376 | .427 |
| 36 | -.299 | 59 | 1.900 | 1.883 | .303 | .324 |
| 37 | -1.486 | 59 | 1.950 | 1.883 | .220 | .324 |
| 38 | -1.158 | 59 | 1.150 | 1.083 | .360 | .279 |
| 39 | 1.678 | 59 | 1.483 | 1.600 | .504 | .494 |
| 40 | .405 | 59 | 1.333 | 1.367 | .475 | .486 |
| 41 | .444 | 59 | 1.900 | 1.917 | .303 | .279 |
| 42 | 1.426 | 59 | 1.050 | 1.117 | .220 | .324 |
| 43 | 1.692 | 59 | 1.883 | 1.967 | .324 | .181 |
| 44 | -1.426 | 59 | 1.967 | 1.900 | .181 | .303 |
| 45 | .000 | 59 | 1.383 | 1.383 | .490 | .490 |
| 46 | 2.053 | 59 | 1.033 | 1.100 | .181 | .303 |
| 47 | .000 | 59 | 1.083 | 1.083 | .279 | .279 |
| 48 | 2.381 | 59 | 1.700 | 1.883 | .462 | .324 |
| 49 | 1.218 | 59 | 1.750 | 1.833 | .437 | .376 |
| 50 | .444 | 59 | 1.950 | 1.967 | .220 | .181 |

## Table 65

## Summary of Responsibility Index Results

| | Test Scale | | | |
|---|---|---|---|---|
| Subgroup | Rebel | Critic Cooperator | Ingratiator | Quantative Data for Tables |
| All Students | + | o | + | |
| Males | + | o | o | 67 |
| Married Females | + | o | + | 68 |
| Single Females | o | o | o | 69 |
| "White" | + | o | + | 70 |
| Indian | + | + | o | 71 |
| Chicano | o | o | o | 72 |

Note: "+" denotes a desirable change, "o" no change, and "-" a negative change.

Table 66

Responsibility Index Results for Total Group

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | 2.64* | 147 | 87.21 | 88.54 | 7.63 | 7.90 |
| Cooperator | -.79 | 147 | 50.69 | 50.34 | 4.77 | 5.51 |
| Ingratiator | -2.56* | 147 | 66.23 | 65.23 | 6.08 | 5.87 |

* Statistically significant, $p \leq 0.10$, N = 148.

Table 67

Responsibility Index Results for Males

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | 1.74* | 65 | 86.62 | 87.96 | 6.25 | 5.72 |
| Cooperator | -.94 | 65 | 50.18 | 49.62 | 4.33 | 4.71 |
| Ingratiator | -1.24 | 65 | 67.15 | 66.41 | 5.27 | 4.64 |

* Statistically significant, $p \leq 0.10$, N = 66.

## Table 68

## Responsibility Index Results for Married Females

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | 1.77* | 59 | 86.95 | 88.40 | 8.76 | 9.89 |
| Cooperator | -.30 | 59 | 51.12 | 50.88 | 5.27 | 5.93 |
| Ingratiator | -2.11* | 59 | 66.25 | 64.90 | 6.81 | 6.92 |

* Statistically significant, $p \leq 0.10$, N = 60.

## Table 69

## Responsibility Index Results for Single Females

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | .87 | 21 | 89.68 | 90.68 | 7.98 | 7.38 |
| Cooperator | -.04 | 21 | 51.05 | 51.00 | 4.66 | 6.52 |
| Ingratiator | -1.00 | 21 | 63.41 | 62.59 | 5.59 | 5.32 |

* Statistically significant, $p \leq 0.10$, N = 60.

Table 70

Responsibility Index Results for Caucasians

| Scale | t-test | DF | $\overline{X}$ Pre | $\overline{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | 2.80* | 125 | 87.29 | 88.68 | 7.64 | 7.88 |
| Cooperator | -.94 | 125 | 50.68 | 50.21 | 4.91 | 5.58 |
| Ingratiator | -2.40* | 125 | 66.19 | 65.23 | 6.14 | 6.03 |

* Statistically significant, $p \leq 0.10$, N = 126.

## Table 71

## Responsibility Index Results for Indians

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | 1.86* | 7 | 87.00 | 93.00 | 8.50 | 4.00 |
| Cooperator | -1.87* | 7 | 51.25 | 48.63 | 3.41 | 3.96 |
| Ingratiator | -1.20 | 7 | 65.75 | 62.38 | 6.54 | 5.07 |

* Statistically significant, $p \leq 0.10$, N = 8.

## Table 72

## Responsibility Index Results for Chicanos

| Scale | t-test | DF | $\bar{X}$ Pre | $\bar{X}$ Post | SD Pre | SD Post |
|---|---|---|---|---|---|---|
| Rebel | -.83 | 10 | 86.82 | 84.73 | 6.26 | 6.70 |
| Cooperator | 1.17 | 10 | 49.82 | 51.82 | 3.87 | 5.08 |
| Ingratiator | .06 | 10 | 67.36 | 67.46 | 5.32 | 3.17 |

* Statistically significant, $p \leq 0.10$, N = 11.

## Table 73

## Summary Impact on Program Objectives

| Objective | Measure | Result |
|---|---|---|
| 1. Know Occupational Interests | CAIV and OVIS (Tables 2 & 3) | Good Knowledge<br>Strong Interests<br>Fair Knowledge<br>Areas Not Interested |
| 2. Know Aptitudes/Abilities | CAIV and GATB (Tables 1 & 3) | Good Knowledge<br>Aptitude Strengths<br>Fair Knowledge<br>Aptitude Limitations |
| 3. Know Work Needs/Values | CAIV & MIQ (Tables 1 & 3) | Good knowledge of what needs to get. Fair knowledge of what needs to avoid. |
| 4. Have Improved (Good/Adaptive) Career Attidues (Career Attitude Maturity) | CMI (Tables 8 & 9) | Improvements are seen, but differ across dimensions and across subgroups. |
| 5. Good Career Choice | CAIV and Professional Judgment (Tables 2, 4, 5, and 6) | The average career choice rates as good bordering on Excellent. |
| 6. Behave more cooperatively with coworkers and employers (other aspects of objective 6 are not quantified and/or are external measures). | RI (Table 65) | Overall, improvements are made on tendency to be rebellious and ingratiate, but results are not consistent across subgroups. |

## Table 73 (Continued)

## Summary Impact on Program Objectives

| Objective | Measure | Result |
|---|---|---|
| 7. Exhibit acceptable job interview skills | Staff Judgment of Videotaped Role-Played Interview | This is an objective (cognitive) completion criterion all students must meet to be program completers and is thus not analyzed further. |

Note: For formal statement of objectives, see Manley and Conrad (1974), and Herr et.al., (1974).

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A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

# SUMMATIVE AFFECTIVE EVALUATION
## PART I

## COUNSELING SERVICES REPORT NO. 30

## SUMMARY OF MOUNTAIN-PLAINS COUNSELING COMPONENT REPORTS - 1973-76

July 1976

BOX 3078 GLASGOW AFB, MONTANA 59231

MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

# INTRODUCTION TO THE AFFECTIVE REPORT SERIES

Mountain-Plains Research is divided into three broad areas with overlap. These areas are: 1) External Evaluation, 2) Instructional/Curriculum Evaluation, and 3) Affective Evaluation. Each of these areas is further subdivided as the logic of the research tasks within each dictates. This document is one report in the series "Affective Evaluation Reports". The six major series of reports in this research area are:

1. Counseling Services Reports
2. Career Guidance Reports
3. Early Childhood Education Reports
4. Parent Involvement Reports
5. Community Development Reports
6. General (Affective) Reports

Individual reports in each series are currently available from, or in the process of being incorporated into, the ERIC system. By the conclusion of the NIE research cycle, Affective Evaluation Reports will number about 100.

Many reports with affective content and importance are not cataloged under any of the affective report series. Reports which are interactive efforts of various research areas are typically produced independently by title, or if extensive, constitute a report series in and of themselves. The Case Studies Reports (25 reports in 3 volumes) are an example of the latter case.

The reader of individual Mountain-Plains documents should keep in mind that a report takes on full significance only in relation to its report series and the overall research program, and that the reader typically finds frequent reference to earlier reports. While each report is designed to have independent value, such "series dependence" is an inescapable aspect of any systematic program of research, and requires some indulgence on the part of the reader.

# SUMMATIVE AFFECTIVE EVALUATION
# PART I

## COUNSELING SERVICES REPORT NO. 30

## SUMMARY OF MOUNTAIN-PLAINS COUNSELING COMPONENT REPORTS - 1973-76

Author:

**Rowan W. Conrad**

July 1976

This Study is a Product of the
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David A. Coyle, Director

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# Summative Affective Evaluation

## Part I

## Counseling Services Report No. 30

## Summary of Mountain-Plains Counseling Component Reports - 1973-76

## INTRODUCTION

During Mountain-Plains' development, twenty-nine Counseling Services Reports (C.S.) and three General Affective Reports (G.A.) were published. Twelve of these reports deal primarily with program analysis and definition, five cover population needs analysis, six concurrently serve for assessment/validation of instruments and population needs assessment, seven measure internal program effects on development as related to counseling objectives, and two focus on the analysis of counseling staff. Several reports in the Electronic Data Processing series (E.D.P.) also deal with the counseling component. The present report is a summative consideration of these reports organized by the aforegoing categories.

## STUDENT NEEDS

Student emotional needs were assumed, prior to program implementation, from the general characteristics of disadvantaged populations. This resulted in the inclusion of personal and family counseling and community programs in the original program design. The internal structure of these elements was only vaguely specified and took form only as specific needs data from students became available for interactive analysis with counseling component structure.

Questionnaire responses indicated that a significant proportion (usually 1/4 to 1/2) of entering students reported difficulty in such areas as self-understanding, perseverance, feeling dumb, and losing temper (see C.S. 7 and C.S. 13). In order to understand problems within a conceptual framework, various theories of personality and personality development were explored. Routine testing of entering students using two theoretically dissimilar tests, the 16 Personality Factor Questionnaire (16PF) and the Personal Orientation Inventory (POI), was initiated. As test data was accumulating, structuring and interpretation of subjective data indicated particular interpretative strength for Erickson's personality development stages. Norm comparison of data from 16PF and POI scales, as related to Erickson's ego qualities, added support to an interpretation of affective problems of the population in terms of "arrested personality development" (C.S. 11 and C.S. 21). Such an understanding enabled further specification of the program objectives, which had been developed from the subjective data (C.S. 4), and was most helpful in assisting counselors set treatment priorities within the multiple interacting problems of their clients. The most recent specification of objectives (C.S. 16) also includes a mechanism, the Developmental Profile Form, for reportive integration of objectives by current personality stage/task.

A more detailed analysis based on Maslow's self-actualization theory (C.S. 12) also showed strong interpretative value for this perspective; however, further explorations of Maslow's more recent work showed that Maslow's concepts were not competitive with ideas derived from Erickson. Rather Maslow's ideas fit within those of Erickson, at least for the age group/developmental stages served by Mountain-Plains.

Final objectives and measures of effect were outlined in C.S. 16 with definitions given where these were added/changed from C.S. 4. Objectives are improvement/enhancement of:

1. Self-Concept
2. Self-Acceptance
3. Personal Responsibility
4. Self-Confidence
5. Dependability/Reliability
6. Self-Knowledge
7. Intimacy
8. Inner Directedness (Inner locus of control)
9. Social Contact Skill
10. Marital/Family Management (Marital Stability)
11. Self-Control (Emotional Stability)
12. Alcohol Problem Resolution
13. Flexibility (Values Internalization)

Counseling Services Report No. 16 also includes the Developmental Profile Form; although its development and use predates the report. The form (sample attached) integrates objectives with personality development theory and shows results at entry and exit on one-to-three scaled measures relating to each objective.

C.S. 7, C.S. 26, and C.S. 27 use factor analytic techniques to validate objectives and to explore and scale dimensions of the Student Inventory questionnaire. C.S. 26 is especially valuable in that factors correspond to, and thus accrue validity evidence for, counseling objectives. Similarly, examining item content of factors and scales in C.S. 27 gives good factoral validity evidence for the scales derived in E.D.P. 15.

As scale dimensions for the POI had been established largely with college students and clinical populations, its validity for disadvantaged adults was unproven. *C.S. 17* and *C.S. 18* are primarily useful in that they validate the test for the current population; although population subgroup descriptions emerging in *C.S. 17* are also of interest in the needs analysis area.

PROGRAM ANALYSIS

Most early reports, including *C.S. 1*, *2*, *5*, *6*, and *9* were focused on the design of the programs and processes involved in development of the Counseling Services Department. *Counseling Services Report No. 10* is the capstone of this effort, describing the final structural, procedural, and theoretical basis of the program. Only minor procedural changes and staff turnover differentiate the current department from that described in the report.

STAFF ANALYSIS

*Counseling Services Report No. 2* was the first student evaluation of staff effort at Mountain-Plains and assessed performance of Case Aides in the Community Development portion of Counseling Services. It is very crude and is perhaps only of historical value.

*E.D.P. 8* and *E.D.P. 10* contain student evaluation of staff ratings on reliable instruments; however, later reports by Bunch and unpublished data from Conrad indicate that scales derived from these instruments, based mainly on items derived to rate instruction rather than guidance or counseling, neither discriminate well among counselors nor demonstrate criterion validity with current staff. *C.S. 23* had shown some criterion evidence for the second scale of the counselor instrument, but the result apparently was spurious as it could not be replicated a year later with a different student and counselor population.

The main value of C.S. 23 was the interpretation of various evaluation sources and criteria in the area of counseling performance. In summary, two "sets" in counselor rating emerged. One set (psychological tests, client ratings, and one counseling supervisor's ratings) seemed to be "competency" based in that there was strong intercorrelation, and this group correlated best with actual gain as measured by pre-post score change on selected POI scales. The other set seemed to be "social desirability" ratings. Rating sources comprising this group were the second counseling supervisor, instructors, and department supervisors, with none of these ratings significantly correlated with actual gain.

All sources did agree on a rather clear dividing line between "more" and "less" competent counselors. Taking the concensus rating of more and less effective counselors, mean profiles showed the more effective counselors to record much more favorable scores (usually one to two standard deviations) on most scales of the Tennessee Self-Concept Scale and the POI.

Overall, the report showed the danger in assigning validity to a counselor rating based on one source or one individual. It also accrued support to those counselor educators and supervisors who argue that the counselor's own personality strength is the key variable in therapy, and that this should be given at least as much weight in training and selection as theory and technique study. Further support emerged in (unreported) data used in preparation of C.S. 28 and C.S. 29. Client gains on the four scales, differentiating counseling effects, tended to be greatest on those scales where the assigned counselor's test showed high scores. Although assignment to counselors is random, C.S. 28 reports an "among counselors" difference on feeling, valuing, and interpersonal relationships scales, further confirming the importance of individual counselor skill and/or personality.

INTERNAL EFFECTS

The program documentation efforts reported in C.S. 5 and C.S. 14 were de facto effects measures, as they are, in effect, a log of those group counseling exercises which had been found to be effective with the Mountain-Plains population. C.S. 15 was the first report showing that a set of these exercises could, in fact, make gains on counseling objectives. C.S. 20 and C.S. 22 also document favorable student development in group counseling.

C.S. 20 is of special value. Circumstances caused a late start in counseling for this group (an average of over two months after program entry). When tested at the first counseling session, profiles did not indicate improvement over those recorded at entry. However, after two months in group counseling, profiles improved significantly. This is the best evidence accrued to date that affective development is a specific counseling effect, or an effect of counseling-instructional area interaction, but does not accrue as a general program effect apart from specific counseling intervention. C.S. 29 makes the most extensive effort to assign effects proportionately to "counseling" and "interaction," concluding that Feeling Reactivity, Self Acceptance,

Acceptance of Aggression, and Capacity for Intimate Contact are primarily counseling effects (Inner Locus of Control and Self Regard are similarly influenced by counseling and the interaction) and that Time Competence, Values Application, Spontaneity, "Optimism," and the ability to see the relationship of opposites, are effects of the general program and/or the interaction. C.S. 20 evidence supports the interaction interpretation.

C.S. 25 indicates more affective development gain for female than male students, with male students as likely to regress as progress on POI variables. C.S. 28 also showed greater gain accruing to completing students on eleven of the twelve POI scales examined than to those who dropped out. Ethnicity was not seen as a major factor affecting affective development in C.S. 28 with only one scale (POI Sr scale) showing a gain difference by ethnic group.

C.S. 28 and C.S. 29 also report and examine entry effects differences by period of entry. Students who entered in 1975 are indicated to show less affective progress than typified 1974 enterers; however, competing explanations for this trend have yet to be resolved.

## CONCLUSION

Subsequent Summative Affective Analysis reports on the counseling component and component variables assume familiarity of the reader with the aforegoing summary of cumulative program development and effects assessment. However, the reader should avoid any tendency to substitute the preliminary findings of these reports for the more thorough examination in subsequent reports.

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